ADMINISTRATION OF THE FEDERAL COAL-MINE SAFETY ACT, CALENDAR YEAR 1955

BY JAMES WESTFIELD, H. F. WEAVER, AND C. M. KEENAN

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FOREWORD

This report presents in full the Annual Report of the Division of Coal-Mine Inspection, Bureau of Mines, for the calendar year 1955, prepared and transmitted to the Congress by the Secretary of the Interior pursuant to the requirements of the Federal Coal Mine Safety Act.

It is believed that the report reproduced herein contains pertinent information important enough to present as an information circular and be made a permanent record as a Bureau publication. Annual reports for the years 1953 and 1954 have been published as Information Circular 7685 and Information Circular 7734, respectively.

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by

James Westfield,[1] H. F. Weaver,[2] and C. M. Keenan[3]

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SUMMARY

A brief résumé follows of some of the most recent activities of the Division of Coal-Mine Inspection that have had a favorable effect on health, safety, and injuries at coal mines:

1. There were approximately 8,510 active coal mines in the United States during 1955. In all, 82,389 regular Federal inspections of coal mines have been made since Public Law 49 became effective in May 1941; 9,823 of these inspections were made during 1955.

2. The Bureau of Mines introduced the revised Coal-Mine Accident-Prevention Course for Supervisors in the coal-mining industry on March 1, 1948. Since that date, 19,455 supervisors and those aspiring to official positions have completed such training conducted by personnel of the Division of Coal-Mine Inspection.

3. The Bureau of Mines introduced the revised Coal-Mine Accident-Prevention Course for Miners in the coal-mining industry on January 1, 1947. Since that date, 139,516 mine workers have completed such training, including 3,212 in special on-the-job classes conducted by Division of Coal-Mine Inspection personnel assigned temporarily to educational work. In addition, thousands of mine workers have been given specialized training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to make tests for gas in accordance with the provisions of sec. 209(d)(9) of the Federal Coal-Mine Safety Act.

4. The Bureau of Mines introduced a short Coal-Mine-Haulage Course in the coal-mining industry on April 1, 1951; since that date 150,546 haulage employees and others have completed such training conducted by Federal coal-mine inspectors.

5. The Bureau of Mines initiated, on May 1, 1951, a short Coal-Mine Roof-Control Course, designed to impress upon mine officials and workmen the need for more adequate roof-control measures and to make all concerned more roof control conscious. This course is very popular and to date has been completed by 390,378 persons.

6. A course was prepared in 1954 to train coal-mine electricians, technicians, and others in electrical safety; 171 have completed this training.

7. Organization work to extend the benefits of the Holmes Safety Association is continuing.

8. The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines of the United States was originally issued by the Director of the Bureau of Mines on July 24, 1946, after consultation with management and labor representatives of the coal-mining industry. The code has been used by Federal coal-mine inspectors during their inspections of bituminous-coal and lignite mines as a basis for determining the existence of unhealthful and unsafe conditions and practices in these mines.

A revised code was issued by the Secretary of the Interior October 8, 1953, following further consultations with representatives of management and mine workers and was incorporated by reference in the 1952 and subsequent bituminous-coal wage agreements. The agreement of May 29, 1946, between the Secretary of the Interior, acting as Coal Mines Administrator under authority of Executive Order 9728, and the United Mine Workers of America, covering bituminous-coal and lignite mines in Government possession, charged Federal coal-mine inspectors with the responsibility of making periodic investigations of the mines and reporting to the Coal Mines Administrator any violations of the Federal Mine Safety Code. These inspectors were active in making prompt investigations of hazardous mines that had been closed by order of the Coal Mines Administrator to determine whether enough improvements had been made to allow the mines to reopen. Federal coal-mine inspectors also had temporary authority to close mines they found to be imminently dangerous, but such authority under Executive Order 9728 was removed on June 30, 1947, when Government control of the mines was terminated.

9. The Safety Standards for Anthracite Mines were prepared by personnel of the Bureau of Mines and have been used by Federal coal-mine inspectors as a basis for determining unhealthful and unsafe conditions and practices during their inspections of the anthracite mines of Pennsylvania. These standards were also revised and issued by the Secretary of the Interior as the Federal Mine Safety Code for Anthracite Mines of the United States on October 14, 1953.

10. Proposed Tentative Safety Standards for Shaft-Sinking Operations and Tentative Minimum Requirements for Fire-Fighting Equipment in Coal Mines have been prepared and are awaiting further consultation with representatives of the industry before final approval.

11. Public Law 328 - 80th Congress, chapter 450 - 1st session, effective for 1 year following its approval on August 4, 1947, required the Secretary of the Interior, acting through the Director of the Bureau of Mines, to submit quarterly reports to the Congress of the United States with respect to the conditions of all bituminous-coal and lignite mines inspected by Federal coal-mine inspectors, all recommendations and notifications sent to the State agencies, and action taken by such mine owners, operators, and the State agencies with respect to his findings and recommendations.

12. Introduction of the bolting method of roof control into the coal-mining industry by the Bureau of Mines in 1948 is a major contribution toward reducing coal-mine accidents. The success of this new method of roof control shows that it is likely to surpass the use of rock dust as a means of preventing loss of life and serious injuries in coal mines. Certain mining engineers and coal-mine inspectors have been especially trained in mine-roof control and roof bolting, and they inform mine operators whether bolting is practical in their mines and, if so, the proper plan of bolting to follow.

13. To further intensify the attack on roof-fall injuries, a program of research and investigation by Bureau of Mines engineers was established in 1953 to develop mobile or portable devices for use at working faces to protect workmen in these areas where most roof-fall accidents occur.

14. The advent of roof bolting brought with it a health hazard from dusts produced during drilling in roof rock. The Bureau has been active in eliminating this hazard by cooperating with manufacturers of mining equipment in designing permissible dust collectors that may be used in lieu of water to allay the dust at its source.

Bureau of Mines Schedule 25, Procedure for Testing Dust Collectors for Permissibility for Use in Connection With Rock Drilling in Coal Mines, became effective January 23, 1952, and was later amended July 23, 1952. Numerous dust collectors have met these requirements and have been approved for use in coal mines under Schedule 25.

15. Schedule 2E, Procedure for Testing Junction Boxes and Electric Motor-Driven Mine Equipment for Permissibility, was revised to conform more fully with the requirements of the Federal Coal-Mine Safety Act and approved as Schedule 2F on August 3, 1955. Also, after extensive research, Schedule 28, covering the regulations for testing conveyor belts for fire-resistant qualities, was approved November 4, 1955, and Schedule 29, covering mine-lighting equipment for illuminating underground workings, was approved January 3, 1956.

16. Federal coal-mine inspectors began investigating all coal-mine fatalities on February 10, 1950. The reports of these investigations are made available to the industry, and the information in them is summarized and published annually with the hope that it will be helpful in preventing accidents in coal mines.

17. On October 2, 1953, a program was inaugurated to have personnel engaged in coal-mine inspection work collect detailed information on dust conditions and dust-control practices in each coal mine inspected to assist the chief, Branch of Health Research, in assembling such information to determine the extent that occupational disease hazards exist in the Nation's mines as a result of exposure of workmen to dust-laden atmospheres. This program has been completed and a report prepared.

18. Research has been started to determine what procedure the Bureau should follow in connection with the development of economical nonflammable hydraulic fluids for coal-mine equipment to eliminate the use of hazardous flammable fluids.

19. Research to develop a fire-resistant insulation for electric cables was initiated in 1955.

20. Other special studies covering roof control, explosives, gases (including restorage of natural gas beneath coal measures), fires, explosions, mining, electricity, haulage, ventilation, rock dusting, and control of atmospheric dusts are being made continually as part of the health and safety program set up under the Federal Coal-Mine Safety Act. Reports of findings and recommendations are made available to the coal-mining industry.

21. Since 1947 personnel of the Bureau of Mines has assisted in preparing proposed revisions of the coal-mining laws of 12 States. The Bureau of Mines will continue to furnish this service to any agencies directly concerned with improving State mining laws, such as labor organizations, coal operators' associations, and State officials.

22. In response to letters from the Secretary of the Interior to the Governors of coal-producing States and personal contacts by field personnel, State-participation plans for joint State-Federal coal-mine inspections, as provided for under sec. 202(b) of title II, Federal Coal-Mine Safety Act, have been approved and are in effect in Alaska, North Carolina, North Dakota, Oklahoma, Washington, and Wyoming.

23. Personnel of the Division of Coal-Mine Inspection take an active part in national, regional, and local safety organizations throughout the coal-mining areas.

24. Coal-mine inspectors and engineers of the division have served on foreign duty in response to requests from other Federal agencies. This provides such agencies with the technical knowledge and wide experience of these experts, and the assignees have the opportunity to add to their fund of knowledge and make pertinent information available to the mining industry in this country.

25. The Division of Coal-Mine Inspection has entered into a cooperative agreement with the Wage and Hour and Public Contracts Divisions of the U. S. Department of Labor, whereby the Bureau of Mines field office promptly notifies the regional office of the Wage and Hour and Public Contracts Divisions of disaster hazards in mines that are not covered by the mandatory provisions of title II but are under contract to furnish coal to the Federal Government. The operators of such mines face cancellation of Government contracts if the hazards are not eliminated promptly.

26. The overall trend of coal-mine accidents has been favorable since the advent of Federal coal-mine inspection. The industry experienced no major disaster during 1955.

The health and safety conditions in coal mines in the United States have been improving steadily since the institution of Federal coal-mine inspections; however, the frequency of roof-fall fatalities and minor mine fires and gas or dust ignitions indicates that much remains to be done before the conditions in many mines can be considered even fairly satisfactory.

The enactment of the Federal Coal-Mine Safety Act, July 16, 1952, affords under title II limited enforcement powers to the Federal coal-mine inspectors with respect to certain safety provisions that might cause or lead up to a major disaster in underground mines that regularly employ 15 or more men underground. However, the act is not designed to and prescribes no mandatory provisions to prevent the so-called day-to-day accidents that result in over 90 percent of the coal-mine fatalities or to prevent accidents in mines that employ regularly less than 15 men underground, which, as a group, usually have high accident-frequency rates. This large field is left to the cooperative efforts among the Federal Bureau of Mines, the State agencies, employers, and employees. The enforcement of rules and regulations as regards day-to-day accidents, safety, health, and welfare is clearly left within the jurisdiction of the several States.

There is no doubt that much more can be accomplished if the mandatory safety provisions of the act are extended to cover mines that employ regularly less than 15 individuals underground, which, as a group, are poorly regulated. This is borne out by the fact that only 17 percent of all the dangerous conditions reported were being corrected during the period covered by this report. Also, the frequency rate for underground fatalities at title I mines in 1955 was 3.72 as compared with a frequency of 1.02 for underground fatalities at title II mines.

INTRODUCTION

This report covers the calendar year 1955 and has been prepared and submitted to the Congress of the United States in accordance with the provisions of sec. 106(a) and sec. 212(c) of the Federal Coal-Mine Safety Act (66 Stat. 692; 30 U.S.C., secs. 451-483).

Background

The Federal Coal-Mine Inspection program was established to carry out the provisions in Public Law 49, 77th Congress, H. R. 2082, approved May 7, 1941. This act has since been amended to be known as Title I - Advisory Powers Relating to Health and Safety Conditions in Mines, under Public Law 552, 82d Congress, approved July 16, 1952, which also includes Title II - Prevention of Major Disasters in Mines. Public Law 552 is known as the Federal Coal-Mine Safety Act.

Congress passed this act as a result of public indignation and the demands for enforcement powers for Federal coal-mine inspectors after a series of seven appalling major coal-mine disasters that occurred between January 18, 1951, and March 27, 1952.

Under the provisions of title I, the Secretary of the Interior, acting through the Federal Bureau of Mines, is authorized and empowered to make, or cause to be made, annual or necessary inspections and investigations in coal mines, the products of which regularly enter commerce or the operations of which substantially affect commerce. The principal functions of the Federal coal-mine inspectors under title I are to determine the causes of accidents and occupational diseases in coal mines and then endeavor to eliminate or ameliorate them (1) by revealing, through personal conferences with mine personnel, correspondence, and published reports, the unhealthful and unsafe conditions and practices existing in the mines and (2) by recommending practical means for correcting the conditions observed. Title I does not provide any enforcement powers, and therefore compliance with the inspectors' recommendations under its provisions is not mandatory; it does give Federal coal-mine inspectors the right to enter coal mines for inspection.

Title I further authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him for the advancement of health and safety in coal mines and for prevention or relief of accidents or occupational diseases therein in such lawful manner as he may deem most effective in the light of the information obtained to promote the accomplishment of the objects for which such funds are granted. To comply with such directive the Division of Coal-Mine Inspection personnel is conducting nationwide safety-education programs for coal-mine officials and coal-mine workmen. In addition, special studies are made of mine health and safety problems relating to roof control, haulage, ventilation, mine disasters, dusts, explosives, gases, electricity, etc.; the results of such studies and any improved methods determined from them are made available to the mining industry and general public through published reports.

The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines, which is used by Federal coal-mine inspectors as the basis for determining the existence of unhealthful conditions and practices in these mines, has been adopted and incorporated by reference in the current National Bituminous-Coal Wage Agreement between the United Mine Workers of America and the bituminous-coal operators, and operators are required to comply promptly with recommendations made to correct violations of the code. The agreement also establishes a Joint Board of Review to which either party to the contract may appeal if it feels that such recommendation would cause irreparable damage or great injustice.

The current Anthracite Wage Agreement between the United Mine Workers of America and the anthracite operators accepts the Federal Mine Safety Code for Anthracite Mines, subject to the right of review by the Director of the Federal Bureau of Mines upon petition from either party to the agreement.

Title II of the Federal Coal-Mine Safety Act is designed to prevent major disasters in mines the products of which regularly enter interstate or foreign commerce or the operations of which substantially affect such commerce, and compliance with its safety provisions is mandatory. However, it applies only to coal mines in which 15 or more individuals are employed regularly underground. To accomplish this, title II requires that the Director of the Bureau of Mines shall cause an inspection of each such mine to be made at least annually to determine whether an imminent danger described in sec. 203(a) exists in any such mine or any provision of the Mine Safety Provisions of sec. 209 is being violated in any such mine or whether any such mine is a gassy mine as prescribed in sec. 203(d). It further provides that the Director shall make or cause to be made such special inspections of such mines as may be required by sec. 203(c) and sec. 206, and such other inspections of such mines as he deems necessary for the proper administration of title II. Provisions have also been made for joint inspections of mines with representatives of the inspection agency of any State that desires to cooperate and submits a suitable plan for participation.

The Advisory Committee

Sec. 108 of title I provides for the appointment of an Advisory Committee composed of not more than six members to exercise consultative functions when required by the Secretary of the Interior in connection with the administration of title I. The following persons constitute the present members of the committee:

Thomas Kennedy, vice president, United Mine Workers of America, Washington, D. C.

W. A. Boyle, assistant to the president, United Mine Workers of America, Washington, D. C.

Charles Ferguson, safety director, United Mine Workers of America, Washington, D. C.

L. C. Campbell, vice president, Eastern Gas & Fuel Associates, Coal Division, Pittsburgh, Pa.

Moss Patterson, vice president, West Kentucky Coal Co., Madisonville, Ky.

J. M. Reid, vice president, The Hudson Coal Co., Scranton, Pa.

Meetings of the committee have been held:

Sept. 3, 1941, at Washington, D. C.
Dec. 3, 1941, at Pittsburgh, Pa.
May 12, 1942, at Washington, D. C.
Nov. 5, 1942, at Washington, D. C.
Jan. 28, 1946, at Washington, D. C.
Oct. 3, 1950, at Washington, D. C.

EMPLOYMENT OF PERSONNEL

Coal-mine inspectors, electrical inspectors, and engineers of the Division of Coal-Mine Inspection are selected from the Civil Service register, and applicants must meet the rigid requirements set up by the United States Civil Service Commission before their names can be included in the register. On July 19, 1954, the register was closed against the acceptance of additional applications.

The current requirements for the several grades of Federal coal-mine inspectors are as follows:

United States Civil Service Commission
Requirements for Federal Coal-Mine Inspectors

Written Description of Some Phase of Coal Mining

Applicants must submit with their application a 300-word description of some phase of coal mining, such as the ventilating system, haulage system, or timbering methods used in a mine familiar to him. The applicant must prepare the description, and he must certify in his own handwriting that he received no assistance in composing it. An applicant who fails to submit this written description, or who submits an unsatisfactory one, or who submits statements copied from texts or other sources of which he is not the author will receive no further consideration under this announcement.

Experience

An applicant must show, as a minimum, the quality and amount of experience prescribed hereafter, unless he substitutes education for experience (see Substitution of Education for Experience following). To establish eligibility in any grade, at least 1 year of the required experience for that grade must have been acquired during the 4 years immediately preceding the date of filing application.

GS-9, $5,440 - Six years of progressive experience in practical coal mining, of which at least 2 years must have been specialized experience in coal-mining operations of medium size that involved responsibility for providing adequate modern safety and health programs in a position of at least the responsibility required of a mine superintendent, mine foreman, mining engineer, or safety inspector. The nature of the experience must have been broader than that of a fire boss, mine examiner, or section foreman and must have demonstrated the ability to perform important coal-mine inspection work under general supervision.

GS-11, $6,390 - Seven years of progressive coal-mining experience, of which 3 or more years must have been specialized experience that required supervision of difficult, important, and responsible work subject only to general supervision and review in a position of at least the responsibility required of a mine superintendent, mine foreman, mining engineer, or safety engineer. The experience must have included the direction, application, and enforcement of modern coal-mine safety and health programs. This experience must also have demonstrated that the applicant has (1) a thorough knowledge of the basic principles applicable to modern programs for promotion of safety and health in coal mines; (2) the resourcefulness, initiative, and ability to perform, direct, and coordinate moderately large scale mine-inspection work of considerable difficulty; and (3) administrative ability, tact, and judgment necessary to promote programs for improved safety, health, and working conditions in coal mines and in applying mine safety regulations.

GS-12, $7,570 - Eight years of progressive experience in the various operations necessary in development and production in coal mines, including at least 4 years of difficult, important, and responsible specialized work that was subject to only general administrative supervision in a capacity such as direct supervisor. This work must have included full responsibility for directing an applying modern coal-mine safety and health programs. This experience must have demonstrated that the applicant has (1) a thorough knowledge of the basic principles applicable in modern programs for promoting health and safety in coal mines; (2) the resourcefulness, initiative, and ability required in a position of at least the responsibility of mine manager, mine superintendent, mining engineer, or safety engineer; (3) the ability to perform, direct, and coordinate large-scale mine-inspection work of unusual difficulty; and (4) administrative ability of a high order, along with the tact and judgment necessary to administer safety regulations and to conduct important conferences with interested parties, such as coal-mine operators, labor organizations, and the general public, on matters related to safety and health of workers engaged in coal mining.

Provisions of Law

Sec. 109 of the Federal Coal Mine Safety Act under which these positions are established provides:

> That in the selection of persons for appointment as coal-mine inspectors no person shall be so selected unless he has the basic qualification of at least 5 years practical experience in the mining of coal, and is recognized by the United States Bureau of Mines as having the training or experience of a practical mining engineer in those essentials necessary for competent coal-mine inspection.

The provisions of law quoted above are made a part of the requirements of this examination. Persons whose qualifications are not such as to receive the recognition of the Federal Bureau of Mines as required by law cannot be accorded an eligible rating in this examination. The nature of each applicant's experience and the required degree of ability will be carefully determined before eligibility and rating are decided. Experience will be evaluated on the type, size, and difficulty of operation in mines in which the applicant has had supervisory responsibility.

Substitution of Education for Experience

A successfully completed course of study in engineering at an accredited college or university may be substituted for part of the required general experience on the basis of 1 year of education for 6 months of experience. Such substitution will be limited to 1 year of required general experience in GS-9 grade and 2 years of required general experience in the GS-11 and GS-12 grades. In each instance, however, the applicant must show the total required amount of specialized experience.

Successful completion of college work in nonaccredited institutions will be accepted on the same basis as indicated for accredited colleges under the requirements for the position, provided that such institutions give instruction of definitely collegiate level and that the State university of the State in which the institution is located accepts the courses and gives advanced credit for them. (In those States where there is no State university, the evaluation and acceptance of college credits as made by the State department of education will be accepted.)

Ability to Drive Automobiles

Applicants must give evidence that they can operate automobiles. Possession of a valid automobile operator's license in the State of legal residence of an applicant will be accepted as evidence.

Citizenship

Applicants must be citizens of or owe allegiance to the United States.

Physical Abilities

Applicants must be physically capable of performing efficiently the arduous duties of this position. They must be free of such defects or diseases as may constitute employment hazard to themselves or endanger fellow employees or others. They must be capable of sustained physical exertion for 6 to 8 hours per day under such hazardous conditions as traveling over rock falls, on steep pitches, in adverse atmospheric conditions, and under low roof where it is frequently necessary to crawl on the hands and knees. Inspectors entering a mine to make an inspection normally carry equipment weighing up to 20 pounds. In emergencies following a mine disaster, they may be required to work for several 2-hour periods a day carrying mine rescue apparatus, which weighs about 40 pounds. Arms and legs must be sufficiently intact and functioning to permit the applicant to perform the duties described above. Vision must be at least 20/50 Snellen in one eye and 20/70 in the other, without glasses. The ability to distinguish basic color is essential. Hearing, with or without a hearing aid, must be acute enough to enable the applicant to hear ordinary conservation at 20 feet. These standards must be met by all applicants; however, certain requirements may be waived for veterans who can demonstrate ability to perform the duties efficiently and safely.

In view of the strenuous physical exertion required for this position, hernia (whether or not supported by truss), organic heart disease (whether or not compensated), varicose veins (unless slight), serious deformities or disabilities of extremities (including weak feet), mental or nervous disease, chronic respiratory or chronic constitutional disease, or other physical defects that would cause the applicant to be a hazard to himself or to others or that would prevent efficient performance of the duties of the position will disqualify him for appointment.

Applicants will be required to submit a certificate of physical examination upon request, and a check physical examination will be made by a Federal medical officer before the oath of office will be administered at the first post of duty. Persons who are offered appointment must pay their own expenses in reporting for duty. If. upon reporting at the place of assignment, they are found to be ineligible because of physical defects, they cannot be appointed, and no part of their expenses in returning home can be paid by the Government.

Basis of Ratings

No written test is required. Applicants' qualifications will be rated on a scale of 100 and will be judged from a review of their experience, education, and training and on corroborative evidence. Applicants may be required to present proof of qualifications claimed but should not submit such proof unless it is requested. Exaggeration or misstatement or submission of a sample of written work that is not the applicant's own will cause disqualification or dismissal from the service.

United States Civil Service Commission
Basic Requirements for Mining Engineers

Applicants for the position of mining engineer must have completed successfully a full 4-year professional curriculum leading to a bachelor's degree in an accredited college or university or have had 4 years of successful and progressive experience in technical engineering comparable to that which would have been acquired through successful completion of a full 4-year engineering curriculum in an accredited college or university.

Tentative Selection and Probational Appointment

After a coal-mine inspector or engineer has been selected from the Civil Service register for possible employment, he is interviewed by a Bureau of Mines official to determine his fitness for the position. If the interview discloses that the applicant is unsuitable for employment, he is no longer considered for the position. If the applicant is considered favorably and has passed the required medical examination, he is given a 1-year probational appointment. Probationers who do not measure up to Bureau of Mines standards are separated from the service in accordance with Civil Service regulations.

TRAINING OF PERSONNEL

Inspectors and engineers usually are given a 4-week course of intensive training in technical matters and Bureau policy at the Bureau of Mines Central Experiment Station, Pittsburgh, Pa., before being assigned to field headquarters. However, in those instances when an inspector is employed to replace an inspector who leaves the service, the new inspector is given on-the-job training first by accompanying experienced inspectors and completes the 4-week training course at Pittsburgh as soon as enough replacements are employed to constitute a class.

The classwork includes lectures, demonstrations, and laboratory work covering such vital subjects as roof control, haulage, mine rescue training, first-aid training, causes and prevention of mine fires and explosions, mine gases and methods of detection and control, mine electricity, ventilation, explosives, methods of collecting and analyzing dust and air samples, method of conducting a coal-mine inspection, method of preparing inspection and investigation reports, operation of automobiles, and general policy matters.

New inspectors are required to accompany experienced inspectors until they have demonstrated their ability and are authorized by the Director to conduct inspections without immediate supervision. They are admonished to go slowly with their first inspections and to be very careful and thorough so that hazards are not overlooked. The need for thoroughness is emphasized throughout the training period and is reemphasized from time to time thereafter, so that there is no misunderstanding of Bureau policy.

One or more coal-mine inspectors of outstanding ability are assigned in certain field-office areas to assist the field officials in supervising the coal-mine inspectors under their jurisdiction. The supervising inspectors accompany the regular inspectors, instruct them when necessary to improve the quality of their work, and submit reports of their observations for critical review and appropriate action.

Coal-mine inspectors and engineers are called upon from time to time to teach the Bureau's accident-prevention courses, to address meetings of persons interested in mine safety, and to confer with groups of mining men - all for the purpose of selling safety. To assure that the inspectors and engineers are better equipped to perform these duties effectively, they have been given a short course of instruction in the conference method of teaching by a nationally known authority on vocational industrial training.

NATIONAL PROMOTION POLICY

A new national promotion policy for Federal coal-mine inspectors was approved and became effective January 1, 1955. It provides in part as follows:

> Policy with regard to grades of coal mine inspection personnel is as follows:
>
> Grade GS-13 is usually associated with managing a subdistrict office covering a very large geographic area (one or more States) in which there is scattered coal mining or a small area in which coal-mining activity and the complexities of operation are concentrated to the extent that it is necessary to impose responsibilities and complexities of management on a supervisor equivalent to that intended by classification standards for grade GS-13. There are exceptions to this in that some highly specialized jobs not involving management of offices or employees are classified to grade GS-13.
>
> Grade GS-12 is associated with minor management responsibilities, with corresponding reduction in supervision, management, and specialized technical assignments of difficult and complicated nature requiring exercise of above-average judgment and tact.
>
> Grade GS-11 is considered the journeyman grade for coal-mine inspection, with closer supervision and more limited exercise of independent judgment.
>
> Grade GS-9 is considered the apprentice grade for coal-mine inspection. Covers inspections with inspectors of higher grades and inspections of the least difficult mines without immediate supervision as part of the inspector training program.

It is established policy that additions to the coal-mine inspection staff shall be made in grade GS-9 and that it is the responsibility of the District Supervisor to provide training and supervision for inspectors in grade GS-9, particularly during the probationary or trial period, necessary to develop and train those individuals and prepare them for journeyman status. The District Supervisor shall subject those individuals to appropriate tests to determine their proficiency. On full proof of an inspector's ability to assume journeyman status, the District Supervisor shall so certify with recapitulation of evidence in support of his finding. After approval by the Assistant Director - Health and Safety, the personnel office having jurisdiction shall proceed with promotion of the individual to grade GS-11 at the then place of employment if the inspector is already doing or is to be immediately assigned in that area for a considerable portion of time to the kind of inspection work classifiable to grade GS-11 subject to limitations inherent in law and regulation. Promotions made other than by certification from the register shall be reported monthly to the Chief Personnel Officer so that the register may be kept current.

It is the policy that the number of positions in each grade shall be flexible and determined by the exigencies of the work as it expands or contracts with changes in the industry, or in the goals set within the Bureau. A system for promotion from grade GS-9 to GS-11 and GS-11 to GS-12 is provided hereinafter.

Inasmuch as the work and responsibilities of grade GS-13 positions require exercise of judgment, tact, initiative, and other special qualifications not practical for measurement by a fixed formula, such as is used for the promotion register, positions in grade GS-13 shall be filled only on the basis of selection by joint action of officials in higher echelons.

It is the policy that coal-mine-inspection positions shall be occupied only by men who are physically fit to perform at any time the rigorous work involved. To insure compliance with this policy it shall be the duty of each District Supervisor to see that each coal-mine inspector is given a full physical examination at Federal expense at intervals of not more than 5 years, preferably 3 years after age 60, or more frequently if considered necessary. This examination shall include full-plate chest X-ray and electrocardiogram and shall be concluded with a statement by the examing physician as to the man's ability to perform the arduous work of a coal-mine inspector. If an inspector is not able to perform such arduous work, the District Supervisor shall move through appropriate channels for disability retirement of the individual or other corrective measures. This procedure shall be applied to all persons whose job title is Coal-Mine Inspector in grades GS-9, GS-11, GS-12, and GS-13, and all other coal-mine inspection personnel, regardless of grade or title, whose position requires that they perform such arduous work.

ORGANIZATION

The Congress appropriated $3,645,000 to carry on the work of the Division of Coal-Mine Inspection during the fiscal year 1956. This provided for a total force of 273 coal-mine inspectors, 34 mining engineers, 6 mining-electrical engineers, 5 mining-explosives engineers, 10 electrical inspectors, administrative officials, and supporting personnel.

Coal-mine inspectors, electrical inspectors, and engineers are headquartered at strategic places in the coal-producing areas in the United States. A list of the field personnel, by headquarters, as of December 31, 1955, is given in appendix A, table 1, and summaries of coal-mine inspectors, electrical inspectors, and engineers, by headquarters and grades, as of the same date are given in appendix A, tables 2 and 3.

Reorganization of the Health and Safety activities of the Bureau of Mines on the basis of a report of a survey team made up of persons from private industry, who were appointed by the Secretary of the Interior, became effective December 19, 1954, in accordance with Administrative Order 695, issued by the Director of the Bureau of Mines, December 8, 1954.

INSPECTION PROCEDURE

The Federal Mine Safety Codes are used as the bases for determining unsafe and unhealthy conditions and practices in all coal mines inspected, and the safety prosions of title II, Federal Coal-Mine Safety Act, are mandatory at all coal mines that employ 15 or more individuals underground regularly.

The standard procedure for inspecting all coal mines (under title I and title II), briefly, is as follows: Generally, notification of an inspection is not given to the mine operators or to the miners. The regular inspection work may require from a day to several weeks, depending on the size of the mine, the thickness and pitch of coal beds, the system of mining, the degree of concentration of working places, the prevalence of hazardous conditions and practices, and other conditions. The inspector is required (a) to inspect every working place in the mine, all active haulageways, entrances to abandoned workings, accessible old workings, airways, escapeways, and other places where men work or travel or where dangerous conditions may exist, electric equipment and installations, haulage facilities, first-aid equipment, ventilation facilities, communication installations, roof and rib conditions, blasting practices, surface plant, etc.; (b) to test for gas and oxygen deficiency in all mines and to collect samples of mine air and mine dusts for chemical analysis, if necessary, to determine precisely the conditions with respect to noxious and explosive gases, oxygen content, and coal dust and rock dust.

In multiple-shift operations the inspector is required to devote part of his time to inspection on each shift so that hazards are not inadvertently overlooked and to spend enough time at the active working faces to observe, wherever practicable, a complete cycle of operations, including cutting, drilling, blasting, loading, hauling, support of roof, etc.

In addition, unannounced "spot-check' inspections are made between regular inspections of certain mines where experience indicates lack of sincere endeavor by the operator to comply with accepted safety standards between inspections.

To assure that the principle of States' rights would be preserved, title II provides for joint Federal-State inspections when a State desires to cooperate in such activities. The Director of the Bureau of Mines is required by the act to cooperate with the official mine-inspection or safety agencies of the coal-producing States. Title II provides further that any State desiring to cooperate in making joint inspections may submit a State plan for carrying out the purposes of this part of the act. Such plans shall designate an authorized State safety or inspection agency to administer the plan and give assurance that such agency will employ an adequate and competent staff of inspectors, assign its inspectors to participate in inspections in the State under title II, and make such reports to the Director of the Bureau of Mines as the Director may require from time to time. The Director, however, is required to approve any State plan that complies with the specific provisions. The Director may withdraw his approval and declare such a plan inoperative if he finds that the State agency is not complying with the spirit and intent of any provision of the State plan.

Where a State plan is not adopted, the Federal coal-mine inspector is responsible under title II to take 1 of 2 courses of action if he finds certain hazardous conditions during his inspections:

a. The first action involves imminent danger. If a Federal inspector finds danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident will occur in a mine immediately or before the imminence of such danger can be eliminated, he issues a written order requiring the operator of the mine to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn from and debarred from entering the area described in the order. The operator is not permitted to resume normal operations in such an area until: (1) The conditions specified in the order are corrected to the satisfaction of three duly authorized representatives of the Bureau of Mines appointed by the Director after receiving an application from the operator for annulment or revision of such order, and the order has been annulled or revised by the Director, or (2) the Federal Coal-Mine Safety Board of Review finds that, after receiving an application from the operator for annulment or revision of the order and after a formal hearing, the condition described in the order was erroneous or no longer exists.

b. The second action involves one or more violations of the Mine Safety Provisions set forth in sec. 209. If a Federal inspector finds that any such mine-safety provision is being violated and that the violation does not cause danger that an explosion, fire, inundation, or man-trip or man-hoist accident will occur in such mine immediately or before the imminence of such danger can be eliminated, he is required to issue a written notice to the operator, giving the operator a reasonable time for correcting the violation. If, upon making his special inspection to determine whether the violation has been abated in the time originally specified, the Federal inspector finds that the violation has been totally abated, he issues another written notice to that effect. If the inspector finds that the operator should be given additional time to abate the violation, he grants an extension of time in writing. If, however, the violation is not abated and the Federal inspector finds that circumstances, such as obvious lack of effort by the operator to correct the condition, do not justify granting an extension of time, he issues a written order requiring the operator to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn from and debarred from entering the area described in the order. Here, again, the operator is prohibited from resuming normal operations in the affected area until the order is annulled or revised by the Director of the Bureau of Mines or by the Federal Coal-Mine Safety Board of Review under the same procedure as described for imminent dangers. Any final order by the Board is subject to judicial review by the United States Circuit Court of Appeals, upon notice of appeal by the Director or the operator.

Where a State plan has been adopted, no inspection of a mine shall be made by a representative of the Bureau under title II unless a State inspector participates in such inspection in accordance with such plan, except where, in the Director's judgment, an imminent danger is deemed to exist and participation by a State inspector would unreasonably delay such inspection. If a Federal inspector issues a withdrawal order citing an imminent danger under sec. 203(a) and a State inspector did not participate in the inspection on which such order is based, the mine operator may request the State agency to assign an inspector to inspect the mine, which must be complied with promptly.

Title II provides further that no withdrawal order shall be issued as a result of failure of an operator to abate a violation of a mine safety provision that does not present an imminent danger under sec. 203(a) at the expiration of the time originally set or extended for abatement at a mine in a State in which a State plan is in effect unless a State inspector participated in the inspection and concurs in such order. If the State inspector does not concur in such order, the operator or the State or Bureau representative may apply to the chief judge of the United States District Court for the district in which the mine is located for appointment of a qualified independent inspector to inspect the mine. If, after such inspection, either the independent or the State inspector concurs in the order, it shall be issued.

Withdrawal orders issued with respect to a mine in a State in which a State plan is effective are not subject to review by the Director but shall be subject to review by the Federal Coal-Mine Safety Board of Review.

In response to requests, sample plans for State participation were drafted and submitted to Alabama, Arkansas, Kansas, Montana, North Carolina, Oklahoma, Washington, and Wyoming to serve as guides in formulating plans for submission to the Director for his approval. On September 29, 1952, a plan submitted by Wyoming was the first to be approved by the Director. Since then, five additional plans have been approved. The States involved and the effective dates of the plans are: Washington, December 17, 1952; Oklahoma, February 13, 1953; North Dakota, February 16, 1953; North Carolina, March 27, 1953; and Alaska, June 15, 1953. During 1955, 11 joint State-Federal inspections were made in Wyoming, 20 in Washington, 13 in Oklahoma, and 2 in Alaska, a total of 46. (See appendix B, table 1.)

Each coal-mine inspector is assigned a district comprising mines that he inspects regularly. This procedure was adopted in 1948 and has resulted in a greater personal interest on the part of the inspector to have the mines under his jurisdiction in the safest condition possible and to keep accidents in them to a minimum. Inspectors are responsible for devising ways and means of reducing accidents in their respective districts, and they are required to improve the effectiveness of their inspections by:

a. Determining the outstanding causes of accidents at the mine to be inspected; this information is used during the inspection as a guide in detecting hazards.

b. Discussing observed hazards and means of correction with the accompanying official at the time the hazard is discovered, with the mine-safety committeemen when feasible, and with high company officials when a conference can be arranged.

c. Enlisting the cooperation of labor, management, State inspection personnel, and all other safety-promotion agencies.

d. Becoming acquainted with management, the officials of the mine workers' organization, and the mine-safety committeemen.

e. Attending local union meetings occasionally to discuss safety with the members and endeavoring to promote cooperation in accident-prevention work.

f. Participating in mining institutes, Holmes Safety Association chapters and councils, and other agencies dedicated to the promotion of mine safety.

g. Assuming a personal interest and a definite personal responsibility in the prevention of accidents.

h. Investigating all fatal coal-mine accidents, gas or dust ignitions, and mine fires in their respective districts.

i. Assisting in rescue, recovery, and investigative work following mine disasters.

j. Assisting mine officials to improve the methods of operation with a view toward greater efficiency, economy, and safety.

k. Conducting training in first-aid and mine rescue procedures and officiating at first-aid and mine rescue contests.

PROCEDURE FOR PREPARING AND DISTRIBUTING COAL-MINE INSPECTION AND INVESTIGATION REPORTS

A preliminary report is prepared by the inspector in accordance with standard regulations following the completion of a regular inspection of a coal mine that employs less than 15 men underground only if hazards of primary importance are observed. Preliminary reports are not prepared for strip mines. Mines that employ less than 15 men underground and strip mines are hereafter called title I mines.

The preliminary report, indicating unsafe conditions and practices considered of primary importance, is prepared by the inspector and posted by him at the mine within one day following completion of the inspection. Field offices of the Bureau of Mines distribute typed copies of the preliminary reports to the mine officials, the State mine-inspection agency, the district and national offices of the mine workers' organization having jurisdiction at the mine, the Washington Office of the Bureau of Mines, and the Geological Survey if the mine is on the public domain or Indian land.

Preliminary reports are not prepared following inspections of mines that employ regularly 15 or more men underground, hereafter called title II mines. In lieu thereof, withdrawal orders, citing imminent dangers under sec. 203(a), or notices, citing violations of sec. 209, Mine Safety Provisions, that do not appear to be imminent, as provided under sec. 203(c), or an order classifying the mine gassy under sec. 203(d) are issued by the inspector to the mine operator during or at the completion of an inspection, and copies are posted on the mine bulletin board. The field offices of the Bureau of Mines distribute typed copies of such notices or orders to the mine officials and the same agencies that would receive copies of the preliminary reports.

A final report on each inspection, prepared promptly by the inspector, contains a general description of the property and of conditions and practices observed during the inspection. All unsafe conditions and practices are recorded in detail, and proper recommendations are made to correct them. Where applicable, violations of the safety provisions of title II that are observed during the inspection are cited, and the action taken to have the violations abated is indicated. Results of chemical analysis of dust and air samples collected during the inspection are listed in the report to provide additional information with respect to conditions at the mine. Substandard and dangerous conditions that are eliminated during the inspection and between inspections are also presented.

As an experimental move to improve compliance with the codes and act, between regular Federal inspections, managements will not be cited in the Federal reports issued in 1956 for violations that are corrected promptly during the inspection. However, if this incentive does not have the desired effect, the policy of reporting such violations will be reinstated in 1957.

Final reports on inspections of coal mines are prepared and mimeographed in the field offices and are distributed from there to management, the State mine-inspection agency, the national and district offices of the mine workers' organization, the Joint Industry Safety Committee (bituminous-coal mines that are affiliated with the UMWA), the Washington Office of the Bureau of Mines, and the Geological Survey if the mine is on the public domain or Indian land.

Enough reports are reviewed in the Washington office after they have been transmitted to all concerned to assure that the rules for preparing and distributing reports are being followed and to obtain information on serious hazards and violations of the safety provisions of the codes and act.

A press release covering salient features of certain reports is prepared and sent to the newspapers in the area where the mine is situated.

The posting and distributing of the reports, the press releases covering them, and the filing of the reports in the Bureau of Mines field and departmental offices for public inspection constitute compliance with that part of the act requiring publication and dissemination of findings.

Reports covering the investigations of all fatal coal-mine accidents, of major and minor coal-mine disasters, and of mine fires and ignitions that are not of disaster proportions are prepared, and the field offices distribute them to all agencies and persons that ordinarily would receive copies of the regular inspection reports.

FOLLOW-UP PROCEDURE

Under the mandatory provisions of title II, an inspector makes special inspections at the expiration of time periods set or extended as reasonable for abatement of violations of sec. 209, and, in instances where men have been withdrawn, upon orders from the Director of the Bureau, in response to a request from the operator, to determine whether the violations have been totally or partly abated.

The inspector can order the operator to withdraw men from the mine or a portion of a mine summarily if an imminent danger is deemed to exist or if the operator has not made a reasonable effort to abate a violation of sec. 209 at the expiration of the time that has been set or extended for abatement.

Sec. 205 provides for the creation of a Federal Coal-Mine Safety Board of Review to hear and determine applications filed pursuant to sec. 207 for annulment or revision of orders made pursuant to sec. 203 or sec. 206. In compliance with these provisions, on August 21, 1952, the President appointed A. U Miller, C. R. Ferguson, and J. G. Solari to serve as members of the first Board; Miller was named chairman. During 1953, E. R. Price, Manager of Coal Properties, Inland Steel Co. (retired), was appointed as the operators' representative in place of J. G. Solari, resigned, and Edward Steidle, Dean Emeritus, School of Mineral Industries, Pennsylvania State University (retired), replaced A. U. Miller as chairman. C. R. Ferguson continues to serve as the representative of the coal-mine workers.

Sec. 206 provides that an operator may apply to the Director for annulment or revision of an order issued under sec. 203. However, where a State-participation plan is in effect, application for annulment or revision of a withdrawal order must be made directly to the Federal Coal-Mine Safety Board of Review.

Sec. 208 provides that any final order issued by the Board under sec. 207 shall be subject to judicial review by the United States Court of Appeals for the circuit in which the mine affected is located upon appeal by the Director or the operator and provides further that the decision of a United States Court of Appeals is final, subject only to review by the Supreme Court.

Inasmuch as Federal coal-mine inspectors have no authority to require compliance with their recommendations made under the provisions of title I, every reasonable and practical effort is made to get these unsafe conditions and practices corrected.

One method is to enlist the cooperation of the State mine-inspection agencies that generally have authority to require the correction of hazards. When an inspector observes unduly hazardous conditions or practices that are not covered by title II during the inspection of a mine, he informs the local mine officials. If prompt action is not taken to correct the hazards, he so advises the mine safety committeemen and also the Bureau of Mines official in charge, who promptly relays the information to the State mine inspector and the head of the State mine-inspection agency by telephone, confirmed by letter, or by letter only, as the exigencies of the case indicate. In addition, the statement of the hazard and the recommendation for its correction are capitalized in the final report to call special attention to them.

Such follow-up procedures undoubtedly have exerted a considerable influence on the improvement in practices and conditions in many mines and on the favorable reduction in coal-mine injury rates.

Seven of the 474 orders requiring the withdrawal of men from underground areas, issued since the effective date of the act, have been appealed to the Federal Coal-Mine Safety Board of Review; and 3 of these issued under a State-participation plan could not be appealed to the Director under the provisions of the act. In each instance where a withdrawal order has been issued and the operator has appealed to the Director of the Bureau of Mines, claiming that the dangerous condition was corrected, Bureau action has been prompt. The Bureau is as much interested as the operators in causing no undue delay in reopening mines after violations of the law are corrected.

During the 42-month period, ended December 31, 1955, that the Federal Coal-Mine Safety Act has been in effect, 13 applications for annulment of gassy classification orders under sec. 203(d) were made to the Director. Of these applications, 10 were denied, and 3 of the orders were annulled. Five of the Director's decisions denying annulment were appealed to the Federal Coal-Mine Safety Board of Review; 2 were upheld by the Board, 2 were reversed, and 1 decision is pending. One application for annulment of a gassy classification order that was made directly to the Board was denied. Three withdrawal orders issued under a State-participation plan in accordance with the provisions of sec. 203(a), citing imminent explosion dangers, were annulled by the Board after finding that the dangers had been eliminated; the Board granted two appeals and denied another regarding orders issued under sec. 203(c), which were appealed directly to the Board; and the Board revised one withdrawal order issued under sec. 203(c) for failure to abate violations of sec. 209(d)(9) by extending the time for abatement to permit training sufficient men in the maintenance, use, and limitations of permissible flame safety lamps to make the required tests for gas. Upon request of the operator, the Bureau provided personnel for this specialized training, at the completion of which the violation was abated and the order was annulled by the Director. Two adverse decisions by the Board were appealed by the Director to the United States Court of Appeals. One order annulling a gassy-classification order under sec. 203(d) was affirmed. The other annulling an order under sec. 203(c) was dismissed because the appeal was not filed within the 30-day limit. (See appendix C.)

REGULAR INSPECTION WORK ACCOMPLISHED

According to a Bureau of Mines survey, 8,510 coal mines were operated more or less regularly during 1955. A tabulation showing the number of coal mines (by types and States) operated in 1955 is included in table 1 of appendix D.

Reference to the performance data in appendix D will reveal that:

a. 9,823 regular inspections of coal mines were made during 1955 (table 2).

b. 82,389 regular inspections of coal mines have been made since 1941, when Public Law 49 became effective (table 2).

c. 4,362 of the 5,735 active coal mines employing less than 15 men underground (title I mines) were inspected during 1955, and the average number of inspections per active small underground mine was 1.0 (table 3).[4]

d. 1,410 of the 1,474 active coal mines employing 15 men or more underground (title II mines) were inspected during 1955, and the average number of inspections per active larger underground mine was 2.4 (table 3).[4]

e. 616 of the 1,301 active strip mines were inspected during 1955, and the average number of inspections per active strip mine was 0.5 (table 3).[4]

f. The average time required to make a regular inspection and to prepare the inspection report, including travel time, was 1.5 days for strip mines, 1.7 days for title I underground mines, and 4.7 days for title II mines, excluding special inspections (table 4). The average total time to complete an inspection of a title II mine, including special inspections, is 5.4 days (table 5).

g. 2,360 special inspections required under title II were made to determine whether violations cited under sec. 203 had been abated. This represents an average of 0.7 special inspection and 0.7 additional man-day inspecting for each regular inspection of a title II mine (table 5).

During 1955 Federal inspectors reported 88,727 violations of the Federal Mine Safety Codes while inspecting 4,362 title I underground mines, an average of 20 violations per title I underground mine inspected (see appendix E), and only 17 percent of all the violations reported were corrected (see appendix F).

Federal inspectors reported 27,106 violations of the Federal Mine Safety Codes while inspecting 1,410 title II mines, an average of 19 violations per title II mine inspected (see appendix E), and 56 percent of the violations of the codes reported were corrected (see appendix F).

A total of 8,701 violations of the mandatory mine safety provisions of title II of the Federal Coal-Mine Safety Act were observed while making 3,484 inspections of these mines during 1955, an average of 2.5 per inspection; but 6,524 (75 percent) of these violations were corrected before the inspections were completed; 2,177 original nitices (form B) were issued at 922 mines granting reasonable time to abate violations that required more time to correct. Subsequent special inspections revealed that 2,369 violations had been abated totally, and 407 notices (form C) were issued granting additional time for abatement of others. About 95 percent of the violations for which notices were posted were being abated at the expiration of the time originally set or the time as extended. Eighty withdrawal orders citing imminent dangers under sec. 203(a) (form A) were issued at 56 mines during 1955, making a total of 178 such orders at 118 mines since July 16, 1952 (see appendix B, table 1 and table 2, for imminent dangers cited by States); 69 withdrawal orders under sec. 203(c) (form D) were issued at 35 mines during 1955 for failure to abate violations within a reasonable time, making a total of 296 such orders at 140 mines since July 16, 1952 (see appendix B, table 1 and table 3, for violations cited); and 15 orders (form B-1) were issued classifying mines gassy under sec. 203(d) during 1955, making a total of 99 such orders issued since July 16, 1952 (see appendix B).

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[4] Due to intermittent operation or abandonment, it was not possible to inspect some mines that operated part time during 1955.

No violations of the Federal Mine Safety Codes were observed while inspecting 18 title I underground mines and 58 title II mines, (see appendix E), and violations of sec. 209 of the Federal Coal Mine Safety Act were not observed while inspecting 348 title II mines (see appendix B); 43 of these mines were free of violations of the codes and the act. These mines are identified in tables 1, 2, and 3, appendix G.

The Federal Coal-Mine Safety Act requires that the Director shall cause an inspection of each mine coming under the provisions of title II to be made by a duly authorized representative of the Bureau of least annually. However, it is believed essential that most title II mines should be federally inspected at least three times a year, that all small underground mines that are not covered by title II should be inspected at least once a year, that strip mines should be inspected as time permits, and that spot-check inspections be made (between regular inspections) at those mines where experience indicates lack of compliance with the provisions of the act. These minimum requirements are desirable because the provisions of title I of the act are purely recommendatory, and title II contains no penalties for noncompliance with its mandatory characteristics between inspections.

In addition to meeting the foregoing mine-inspection schedule, Federal inspectors are required to perform special duties, such as investigating fatal accidents, nonfatal serious roof-fall accidents, gas or dust ignitions, and mine fires; making dust surveys; reviewing reports; working in supervisory capacities; assisting with rescue, recovery, and investigative work following mine disasters; teaching the Bureau's accident-prevention classes; organizing Holmes Safety Association chapters; and doing various other jobs. These special assignments are quite essential to comply with the provisions in the Federal Coal-Mine Safety Act and to obtain the greatest benefits from the regular inspection work.

A tabulation of the force of inspectors and engineers employed on December 31, 1955, is given in appendix A, table 2 and table 3.

SPECIAL WORK ACCOMPLISHED

Although the routine inspections of coal mines and the distribution of inspection reports are primary functions of personnel of the Division of Coal-Mine Inspection, it is realized that the effectiveness of the inspections is enhanced when mine supervisory personnel and mine workmen have enough technologic and practical knowledge of modern concepts of coal-mine safety to recognize an unsafe condition or practice when it exists or is developing and know how to correct it. The opportunity to obtain such knowledge through the Bureau of Mines was not available generally before 1947, principally because funds were not made available for conducting the necessary training.

The need for providing this opportunity is recognized in section 106 of the Federal Coal-Mine Safety Act, which authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him to advance health and safety in coal mines and prevent or relieve accidents and occupational diseases in mines in such lawful manner as he may deem most effective in the light of the information obtained under the act to accomplish the object for which such funds are granted.

To comply with such directive, the outstanding special work accomplished during 1955 is described hereafter. A tabulation of miscellaneous special work is included in appendix I of this report.

Coal-Mine Accident-Prevention Course for Miners

The National Bituminous-Coal Wage Agreement provides that:

> At each mine there shall be a Mine Safety Committee selected by the local union. The Mine Safety Committee may inspect any mine development or equipment used in producing coal. If the Committee believes conditions found endanger the life and bodies of the mine workers, it shall report its findings and recommendations to management. In those special instances where the Committee believes an immediate danger exists and the Committee recommends that management remove all mine workers from the unsafe area, the operator is required to follow the recommendation of the Committee.

The Anthracite Wage Agreement provides that:

> Mine Committees, acting on the request of individual employees or upon their own personal knowledge, shall have the right to report to management unsafe conditions affecting operations or equipment. In such cases, the Mine Committees shall have the right, accompanied by representatives of management, to make necessary inspections of property or equipment for the ascertainment of actual facts. In the event such conditions, when reported, are not satisfactorily corrected, the Mine Committee shall request action by the State and Federal inspectors.

To assure that members of these committees would be well-versed in the provisions of the Federal Mine-Safety Codes and thereby be better equipped to recognize unsafe conditions and practices that exist or are developing and to learn the proper means of overcoming them, the Bureau of Mines, in cooperation with the United Mine Workers of America, inaugarated a Coal-Mine Accident-Prevention Course for Mine-Safety Committeemen in January 1947. The course covers the practical and some technical aspects of modern principles of coal-mine safety and requires 20 hours of classroom work. It had such enthusiastic endorsement by mine-safety committeemen and mine operators that it was decided to extend the enrollment opportunity to all mine workmen. The popularity of the training is attested by the record. From the time the revised training program was begun on January 1, 1947, to December 31, 1955, 139,516 mine-safety committeemen and miners had completed the course. Included in these figures are 3,212 men who completed special on-the-job accident-prevention training, which was initiated at a large, eastern coal mine in February 1952 (see appendix H for 1955 training). Usually the classes are conducted by Federal coal-mine inspectors who have been especially trained and authorized to carry on instructional work.

In addition, 3,022 have received specialized training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to make proper tests for gas in places where electric machines are operated in face areas in accordance with the provisions of sec. 209(d)(9) of the act (see appendix H for 1955 safety educational training).

Coal-Mine Accident-Prevention Course for Supervisors

Congress appropriated funds to continue the employment of mining engineers to train coal-mine supervisors in the modern principles of mine safety. The Bureau's Coal-Mine Accident-Prevention Course for Supervisors requires 40 hours of classroom instruction and covers all technologic as well as practical phases of safety as applied to: Surface facilities; timbering and roof control; the transportation, storage, and use of explosives; ventilation and mine gases; coal dust and rock dust; haulage; electricity; safeguarding equipment; fire prevention and control; and other miscellaneous items. The course includes lectures, class discussions, actual demonstrations, and the use of visual aids, such as motion pictures, slides, and blackboard sketches.

This training program has been successful, and from March 1948 when the revised course was first offered to December 31, 1955, 19,455 coal-mine supervisors and others aspiring to such positions completed the training (see appendix H for 1955 training).

Electrical Safety Course

An outline for a course in electrical safety titled "Electrical Fundamentals and Principals for Coal-Mine Electricians and Supervisors" was prepared by personnel of the division, and initial training in the industry was begun in 1954. To date, 147 coal-mine personnel, 9 State inspectors, and 15 Federal inspectors have completed the course (see appendix H for 1955 training).

The Holmes Safety Association

Coal-mine-inspection personnel take an active interest in the Holmes Safety Association, which has been sponsored by the Bureau of Mines since 1926, when it was adopted as part of the Bureau's safety educational program to promote health and safety in the mineral industries through the cooperative efforts of management and labor and State and Federal agencies. In 1954 the Bureau began to intensify its efforts to expand the operations of this organization to mining areas in all parts of the United States and is having success. This stepped-up program is being conducted by specially trained Division of Coal-Mine Inspection personnel in the coal-mining areas. As a result of this drive there were, at the end of 1955, 277 chapters, 19 local councils, 2 State councils, and 1 national council active in 13 States and Washington, D. C.

Experience has proved that injury rates are lower than average in mines that have membership in this association.

Investigation of Fatal Coal-Mine Accidents

The Bureau of Mines has investigated major mine disasters since its inception in 1910 as part of its accident-prevention program, and the conclusions drawn from these investigations have been used as a basis for recommending measures to prevent recurrences. The Bureau also has investigated explosions and fires in which less than five or no lives were lost, but before 1950 it was not general practice to investigate fatalities resulting from occurrences other than mine fires or explosions. The Bureau has long recognized the need for a comprehensive study of fatal accidents, but the task was too great for the limited available personnel. On the basis of the improved rate at which fatalities were occurring in coal mines and the increases in inspection personnel provided by Congress in recent years, investigations of all fatal accidents have been made since February 10, 1950. The Federal inspector prepares a report of each investigation, and it is distributed to the instructors of the accident-prevention courses and the same agencies and persons who ordinarily would receive copies of the regular coal-mine inspection report. The report gives the facts about the accident, presents the inspector's conclusions regarding the cause, and includes appropriate recommendations for the prevention of similar occurrences.

The information in the reports covering the investigations of coal-mine fatalities that occurred during the calendar years since 1950 has been condensed and published annually. It is particularly useful to officials of coal companies and of the mine workers' organizations in planning accident-prevention programs; to safety directors, inspectors, instructors, and supervisors who need such information to carry out their duties more effectively; and to mine workers who must know the causes of accidents to be better able to prevent injury to themselves and their fellow workmen. The ultimate objective is to provide information that will be helpful in preventing accidents.

This is the first time in the history of coal mining that the Bureau of Mines or any other agency or person has assembled, on a nationwide basis, detailed reports on the investigations of all fatalities occurring in coal mines of the United States and Alaska.

Roof-Control Work

Accident statistics have indicated for years that falls of roof and coal cause over half of the fatalities that occur in coal mines, and this record has challenged all the forces interested in improving the accident rates in the coal-mining industry. The Bureau of Mines has done a considerable amount of research on mine-roof control when funds were available, but as late as 1948 no person or agency produced any new or improved means of satisfactorily solving the problems presented by this No. 1 killer of mine personnel. The Bureau has realized that, to reduce coal-mine injuries to a greater extent it would be necessary to find better methods of roof control, and in 1948 the Bureau's efforts in that direction culminated in general introduction in the coal-mining industry of a new means of roof control known as roof bolting. The basic principle involved is to prevent the initial sag in exposed roof strata by converting the strata into a rigid beam, with steel bolts set in holes drilled in the roof rock. The bolts must be installed as soon as the roof is exposed by the normal process of mining.

After enough experimental work was conducted to prove the practicability and safety of bolting under controlled conditions, the method was given wide publicity in Bureau of Mines publications and in the trade journals. To satisfy the demand of mine operators for the Bureau's suggestions for installing roof bolts and to assure that the method would not be condemned as a failure because of improper installations, the Bureau trained certain Federal coal-mine inspectors and engineers to qualify as expert consultants in roof bolting; these experts are now headquartered in coal-mining areas where their services are needed. Generally, the mine operators obtain the advice and recommendations of the Bureau experts before any bolts are purchased, and some States now require mine operators to obtain a permit from the

State inspection agency before roof bolting can be started. Such wise precautions have contributed much to the success of this new method of roof control.

Before roof bolting is adopted in any mine, the Bureau of Mines recommends the following procedure:

Controlled experiments to determine whether roof bolting is applicable should be made in conformance with the procedures that have been worked out by the Bureau of Mines. Bureau experiments are made under controlled conditions with auxiliary conventional supports during the initial experimentation. After a safe and economical method of bolting is determined, there should be no deviation from this method without undergoing a new experimental period. Also, if roof conditions change radically from those during the initial experimental period, a new experimental period should be undergone.

Federal coal-mine inspectors observe roof-bolting procedures during their regular inspections of coal mines and report deviations from the established plans, along with other substandard practices of roof support.

The attitude of mine operators toward roof bolting is described best by saying that roof bolts are being used in 430 coal mines. They are used exclusively in a number of large mines; according to the records, when installed as recommended by the Bureau of Mines, roof bolts simply and effectively prevent falls of roof. The installations have not been made in enough mines to have a noticeable effect on the accident rates in the entire coal-mining industry; however, the use of roof bolts has expanded, and the success attained at mines where they are being used indicates what may be expected as their use becomes more general.

The introduction of roof bolting to the coal-mining industry marks another major contribution of the Bureau of Mines in its efforts to fulfill the primary objective of the Congress in establishing the Bureau in 1910 - to prevent accidents in the mineral industries.

Supplemental to the foregoing roof-control activities, a mining engineer has made a thorough study of the possibilities of using various protective coatings to prevent disintegration of roof rock, with special attention to health and fire hazards involved. This work has been completed, and a set of safety standards covering roof coating has been prepared for the use of Federal inspectors and the industry.

As a further means of reducing the incidence of roof-fall accidents, the Bureau of Mines initiated a Coal-Mine Roof-Control Course in May 1951. It consists of about 30 minutes to 1 hour of lecture and discussion and is presented to coal-mine officials and employees by Federal coal-mine inspectors, usually after inspection of a mine has been completed. The course is designed to impress upon mine personnel the need for more adequate roof-control measures and to make all concerned more roof conscious; it was introduced in the industry in July 1951, and from that time to December 31, 1955, 390,378 mine personnel completed the training (see appendix H for 1955 training).

Although systematic timbering, use of roof bolts, and training miners to be constantly alert to roof conditions have been effective in reducing fatalities, roof falls still cause more than half of all coal-mine fatalities, mostly in the areas within 12 feet of the working faces where the stability of the newly exposed roof cannot be immediately determined. In an effort to provide a means to guard against these unforeseen dangers, the Bureau is arranging an intensified program of research and investigation to develop mobile or portable devices that can be readily advanced with the working faces to protect workmen in the critical face areas. Success in this endeavor would be an outstanding advance in safety for the industry.

Coal-Mine-Haulage Safety Course

In April 1951 a Coal-Mine-Haulage Safety Course was completed and introduced in the coal-mining industry. The course consists of lectures and illustrations with respect to haulage safety and is presented to mine personnel by the Federal coal-mine inspectors, usually upon the completion of an inspection. From April 1, 1951, to December 31, 1955, 150,546 coal-mine haulage employees, officials, safety committeemen, and others completed this course (see appendix H for 1955 training). In view of the comparatively few men employed in haulage operations at coal mines the number of trainees has been outstanding.

Injury and Employment Data

One of the special duties of coal-mine inspectors and engineers of the division is to enlist the cooperation of coal-mine operators in submitting to the Bureau of Mines reports on injury and employment statistics in compliance with sec. 105 of the Federal Coal Mine Safety Act. If an operator needs instruction on how to fill out the proper forms, the inspector or engineer is prepared to give the advice needed. This work is done while the mine is being inspected and has resulted in the submission of more and better reports by mine operators.

Ventilation Surveys

Certain mining engineers of the Division of Coal-Mine Inspection are assigned to coal-mine-ventilation studies, surveys, and research. Especially difficult ventilation problems are encountered in mines from time to time, and mine operators request the Bureau's assistance in solving them. Many of these studies require pressure surveys and technical calculations that the regular coal-mine inspectors usually are not equipped to make (appendix D, table 2).

Explosives Surveys

Mining-explosives engineers of the division conduct special investigations with respect to the storage, transportation, and use of explosives and blasting devices. Generally, such studies are made at the request of mine operators interested in improving the safety and economy of their operations.

The Bureau of Mines has advocated the exclusive use of permissible explosives or permissible blasting devices in coal mines for many years and has advised against the use of black blasting powder and dynamite, which have caused so many gas and dust explosions, with attendant heavy casualties. The mining-explosives engineers did a considerable amount of educational work, demonstrating to mine operators by performance tests in the mines that the use of permissible explosives is much safer than and as economical as black blasting powder. Through their efforts and the efforts of the regular coal-mine inspectors, dangerous black blasting powder has been rapidly disappearing from coal mines. The mandatory provisions of title II ban storage, use, and handling of black blasting powder in mines coming under title II coverage, and the mining-explosives engineers have, when requested, been of great assistance to coal-mine operators in making the required changeover to safer methods of breaking down the coal efficiently (appendix D, table 2).

Electrical Surveys

The mining-electrical engineers and electrical inspectors of the Division conduct special technical investigations of electrical facilities and installations in coal mines, generally at the request of mine operators (appendix D, table 2). The engineers also are assigned to cooperate with the industry in conducting research work on electrical apparatus with a view toward designing safer equipment. The electrical inspectors also advise and assist the coal-mine inspectors in making determinations of the status of permissible electrical face equipment as required by sec. 209(f)(1) of the Federal Coal-Mine Safety Act.

Considerable research was done in 1954-55 to develop an equivalent protective device to replace the frame-grounding conductor in trailing cables of mobile electrical equipment. The reduction of insulating materials in and increased rigidity of trailing cables necessitated by incorporating an additional conductor has caused many trailing-cable failures, some with disastrous results. With the cooperation of manufacturers of such equipment one such device has been certified by the Bureau as an acceptable equivalent device, and some experimental devices have been put in service in nongassy mines to determine their safety and efficiency.

Dust Surveys

From January 21 to 31, 1946, a course of instruction in the Determination and Control of Unhygienic Dusts was given by personnel of the Bureau's Health Branch to certain employees of the Divisions of Safety and Coal-Mine Inspection. The object of the training was to provide each main field station with a qualified man to determine the concentration of airborne dusts in coal mines and to cooperate with dust experts of the Division of Health in conducting such surveys.

The importance of dust control in coal mines is recognized by the mining industry, and the Bureau of Mines is continuing its research on airborne mine dusts with the view to collecting enough data to be used as a basis for determining the concentrations of certain dusts that are considered harmful from a health standpoint and to determine the method and type of facilities best suited for controlling dusts (appendix D, table 2).

On October 2, 1953, a program was inaugurated to have personnel engaged in coal-mine inspection work collect information on airborne dust conditions and dust-control practices in each coal mine inspected and submit a detailed report thereon to the chief of the Branch of Health Research to assist in assembling data to determine the extent that occupational disease hazards exist in the Nation's mines as a result of exposure of workmen to dust-laden atmospheres. This program has been completed, and a report thereon has been prepared by the Branch of Health Research.

In promoting the adoption of roof bolting the Bureau has been aware of the health hazard introduced by drilling holes in silica-bearing strata. In keeping with Bureau policy to see that proper equipment is available to the industry, Bureau of Mines Schedule 25, Procedure for Testing Dust Collectors for Permissibility for Use in Connection With Rock Drilling in Coal Mines, was approved January 23, 1952, and amended on July 23, 1952. Many dust collectors have met these requirements and have been approved and are available for use in coal mines under Schedule 25.

In an effort to provide more efficient and economical means of preventing the propagation of dust explosions in bituminous-coal mines, an engineer of the division has been assigned to determine the possibilities of devising through intensive research new and more practical, effective, and positive means of preventing the propagation of dust explosions underground, other than dry rock dusting; to conduct research in the development of more economical and efficient means of applying rock dust on mine surfaces; and to conduct research to find improved methods and equipment for dust-sampling a coal mine to determine promptly whether or not rock-dust applications are adequate. Beneficial results of this program are to be made available to the coal-mine industry.

Dust Explosions in Coal-Preparation Plants

Following several violent dust explosions in coal-preparation plants using thermal driers, the Bureau began a widespread investigation in 1954 to determine the causes of and present recommendations to prevent fires and explosions due to "puffs" and "flashbacks" in such plants. This investigation has been completed and a report thereon prepared for publication.

Conveyor-Belt Fires

Following a meeting in Washington in 1954 of representatives of the State inspection departments, coal operators, mine workmen, manufacturers, the Bureau of Mines and other interested agencies, a committee was appointed to investigate the causes of belt fires in underground conveying systems and recommend means of preventing such fires, including flame-resistant belts. As a result of extensive research along this line, Schedule 28 for testing fire-resistant conveyor belts was prepared and finally approved November 4, 1955.

Research to Minimize Hydraulic-Fluid Fire Hazards

Steps were taken late in 1955 to initiate a study to determine what procedure the Bureau should follow in connection with testing for research and development of economical nonflammable hydraulic fluids for use in mine equipment. The present flammable fluids used in hydraulically controlled equipment present serious hazards in mines when fires occur on or near such equipment. Bursting hydraulic systems have caused many mine fires to spread out of control. The development of an economical, efficient, nonflammable fluid would materially decrease these occurrences.

Fire-Resistant Trailing Cables

To combat the continuing occurrence of trailing-cable fires, an investigation has been started to determine the possibility of using fire-resistant materials as insulation to replace flammable rubber compounds now used to cover cable conductors and flammable materials employed to insulate cable splices.

Permissibility Schedules

Schedule 2E, Regulations Governing Permissibility Tests for Electric Motor-Driven Mine Equipment, Junction Boxes, and Other Accessory Equipment, was revised and approved August 3, 1955, as Schedule 2F to conform more nearly to the provisions of the Federal Coal-Mine Safety Act.

A new Schedule 29, Mine-Lighting Equipment for Illuminating Underground Workings, was prepared and approved January 3, 1956, after extensive research.

Schedule 28 for testing the fire-resistant qualities of conveyor belts was approved November 4, 1955.

Safety Standards

Proposed Tentative Safety Standards for Shaft-Striking Operations and Tentative Minimum Requirements for Fire-Fighting Equipment in Coal Mines were prepared. Approval of these manuscripts has been held up pending further discussion with representatives of the industry.

Study of Natural-Gas Restorage Areas in Coal Fields

Because the restorage of natural gas, some at pressures above the initial rock pressures, in the exhausted sands under active coal-mining areas and the installation of high-pressure gas transmission lines overlying active coal-mining areas present potential gas-explosion hazards in the adjacent coal-bearing strata, considerable work has been done to chart and correlate the gas restorage fields and the gas-transmission lines with the active coal-mining areas. Division personnel cooperated with coal-mine operators and appeared before legislative committees to assist in formulating legislation to protect coal-mine workmen and mining properties.

Participation in Safety Organizations

Personnel of the Division of Coal-Mine Inspection take an active part in the National Safety Council, its various affiliated regional organizations, the Mine Inspectors' Institute of America, the National Mine Rescue Association, the American Mining Congress, and other national, regional, and local safety organizations throughout the United States by serving as officers and on committees and participating in the various programs.

The chief of the division serves as secretary of the Coal-Mining Section, National Safety Council, and is editor of the Section's Monthly News Letter.

Cooperation With Other Federal Agencies

In response to requests from other Federal agencies, personnel of the Division of Coal-Mine Inspection have accepted special assignments to Colombia, Austria, Korea, Venezuela, Turkey, Germany, and India. All of these missions have been completed.

Such assignments of engineers and inspectors serve a twofold purpose: (1) The agency to which the Bureau experts are loaned receives the benefit of their wide experience in mining, and the experts add to their fund of knowledge; and (2) the information obtained through such special work is made available to the mining industry if such action is deemed in the public interest.

Personnel of the Division of Coal-Mine Inspection cooperate with the Wage and Hour and Public Contract Divisions, United States Department of Labor, in administering the Public Contracts section of the Walsh-Healy Act. Under the cooperative arrangement, the Bureau of Mines field office promptly notifies the local regional office of the Wage and Hour and Public Contracts Divisions if disaster or serious hazards are found by Federal coal-mine inspectors at title I mines under contract to furnish coal to the Federal Government. When disaster or serious dangers are reported, personnel of the United States Department of Labor require the mine operator to eliminate the dangers or face cancellation of the contract.

Revision of State Coal-Mining Laws

Since 1947, the Division of Coal-Mine Inspection has assisted in preparing proposed revisions of the coal-mining laws of 12 States.

The safety-regulations sections of the proposed revisions were designed along the lines of the Federal Mine-Safety Codes, thus assuring more modern and standardized State coal-mining laws, and they have been adopted substantially as written in Alabama, Colorado, Indiana, Maryland, Montana, Tennessee, and Wyoming. Proposed revisions of such laws for Arkansas, Illinois, Kentucky, Ohio, and Oklahoma were prepared but either were not enacted or not introduced in the legislature.

The Bureau of Mines will continue to furnish this service to any agencies directly concerned with improving State mining laws, such as labor organizations, coal operators' associations, and State officials.

This contribution toward the reduction of injuries in coal mines is another major and vitally important step taken by the Bureau to fulfill its obligations to the coal-mining industry.

First-Aid and Mine Rescue Training

Personnel of the Branch conducted first-aid and mine rescue training for coal-mine personnel. During 1955, 11,751 persons completed the course in first aid, and 451 persons completed the mine rescue training (appendix H).

Miscellaneous Special Assignments

A breakdown of the miscellaneous special assignments completed during 1955 is given in appendix I.

ACHIEVEMENTS

This report covers the 3d full calendar year of inspection of coal mines under the Federal Coal-Mine Safety Act and the 14th full calendar year of Federal coal-mine inspection work. The effectiveness of the work done by all concerned in fulfilling the principal purpose of Federal inspections - the reduction of accidents in coal mines - is revealed in part by comparing the injury records attained during equal 10-year periods before and after 1941 when the law became effective. The injury records for the calendar years 1952-55 are also given to build up a new 10-year period.

During the 10 years before Federal inspection of coal mines the fatality-frequency rate per million man-hours of exposure in anthracite mines of Pennsylvania was 1.61, and the nonfatal-frequency rate was 105.94. During the next 10 years, under Federal inspections, the fatality rate was 1.11, and the nonfatal rate was 80.19. During the subsequent 4-year period, 1952-55, the fatality-frequency rate for anthracite mines was 1.12, and the nonfatal rate was 67.41.

During the 10 years before Federal inspection of coal mines the fatality-frequency rate in bituminous mines was 1.48, and the nonfatal-frequency rate was 65.81. During the next 10 years, under Federal inspections, the fatality rate was 1.18, and the nonfatal rate was 55.58. During the subsequent 4 years, 1952-55, the fatality-frequency rate dropped to 0.93 and the nonfatal rate to 46.26. (See table 1, appendix J, for details.)

A record of the number of fatal and nonfatal injuries, by calendar years, that have occurred in the coal mines of the United States since 1932 is shown in table 2 of appendix J. Preliminary figures indicate that the number of fatalities increased from 395 in 1954 to 413 in 1955, and the nonfatal injuries increased from 19,005 to 19,710; however the fatal- and nonfatal-frequency rates dropped from 1.04 to 1.02 and from 49.81 to 48.58, respectively. The 1953 accident record is the best in the history of the coal industry.

The number of major coal-mine disasters in the United States and the fatalities resulting from them are listed for each year since 1931 in table 3 of appendix J. A major disaster is defined as any accident that causes the death of five or more persons. Two major coal-mine disasters have occurred since the effective date of the Federal Coal-Mine Safety Act. The first of these, which caused the death of five men in 1953, was the result of a coal-dust explosion initiated by a blownout charge of black blasting powder in an Iowa mine. A temporary restraining order issued by a State court prohibited Federal inspectors from enforcing the ban on the use of black blasting powder as provided for in the Federal Coal-Mine Safety Act. The other, in November 1954, killed 16 men, 1 on the surface and 15 entombed underground, when a violent explosion followed by a roaring mine fire necessitated sealing the mine surface openings to smother the fire before recovery operations could proceed.

Table 4, appendix J, compares the underground fatality-frequency experience in title I and title II mines for 1951-55.

Major improvements in coal mines during the past 14 years contributed much to the favorable decrease in the injury rates. The records show that since December 1941 a systematic roof-support plan has been adopted in 2,622 mines; the use of dangerous black powder was discontinued in 1,736 mines; new main fans were installed at 3,198 mines; auxiliary blower fans with tubing were removed from 612 mines; preshift examinations for gas and other dangers were begun in 3,422 mines; onshift examinations for gas were begun in 2,507 mines; the use of water to allay dust was initiated in 1,050 mines; 1,996 mines were rock-dusted for the first time; second openings were provided in 1,025 mines; smoking was discontinued in 1,746 mines; and the use of open lights was discontinued in 1,544 mines. (See appendix K for details.)

The favorable results attained during the past 14 years are not due to the efforts of any one group or agency, but it is well known in mining circles that Federal coal-mine-inspection activities have been, and continue to be, a great influence in giving deserved attention to health and safety in coal mines. The Bureau has striven, with success, to have management and labor work hand-in-hand to iron out their safety and health problems. It is the cooperative efforts of management, labor, State inspection agencies, manufacturers of mining equipment, coal operators' associations, the Federal Bureau of Mines, and other agencies interested in mine safety that have brought about the improvements in conditions and practices that have resulted in continuing reduction in coal-mine injuries.

NEED FOR LEGISLATIVE ACTION

It is evident that many hazards that might lead to a disaster are being eliminated in the mines that come within the scope of the mandatory provisions of the Federal Coal-Mine Safety Act, but much more can be accomplished if the enforcement powers afforded the Federal inspectors were expanded to cover most of the smaller mines - those employing less than 15 men underground - which, as a group are poorly regulated. This is borne out by the fact that the underground fatality-frequency

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rate for mines employing 14 or less men underground, title I mines, was 3.72 during 1955 as compared with 1.00 for mines employing 15 or more men underground, title II mines. These data are given in appendix J, table 4.

PUBLICATIONS

The following Bureau of Mines publications, issued during 1955, were prepared wholly or partly by personnel of the Division:

Publication	Title	Authors
HSS 435	Fatalities at Pennsylvania Anthracite Mines, 1954.	J. V. Mather
HSS 436	Falls of Roof - The No. 1 Killer at Bituminous-Coal Mines - 1954.	James Westfield Harry Weaver
I. C. 7712	One Hundred Percent Cooperative First-Aid Training, Mines and Quarries, Colorado Fuel and Iron Corporation, Colorado and Wyoming.	A. C. Moschetti G. B. Fritts
I. C. 7716	Preventing Coal-Mine Fires Caused by Electrical Equipment.	C. L. Brown
I. C. 7734	Administration of the Federal Coal Mine Safety Act Calendar Year 1954.	James Westfield H. F. Weaver C. M. Keenan
R. I. 5147	Changes of Atmospheric Pressure on Gas Emissions From Worked-out Areas in an Illinois Coal Mine - 1955.	D. D. Dornenburg J. A. O'Connor E. J. Harris

APPENDIX A

TABLE 1. - Personnel of the Division of Coal Mine Inspection Employed as of December 31, 1955 and Coal Area Covered by Each Field Office

Health and Safety District A

Edward H. McCleary, District Supervisor
Wilkes-Barre, Pa.

Coal area covered - Pennsylvania anthracite region

Nicholas M. Benson	Coal-mine inspector	Wilkes-Barre, Pa.
Vernon H. Bowling	do.	Do.
Robert W. Brown	do.	Do.
Lee B. Carson	do.	Do.
George W. Culverhouse	do.	Do.
Gerald W. Fortney	do.	Do.
Denver S. Griffith	do.	Do.
David M. Hart	do.	Do.
Charles E. Jones	do.	Do.
James R. Laird	do.	Do.
Harvey P. Landis	do.	Do.
Joseph R. Lindsey	do.	Do.
Joseph V. Mather	Mining engineer (explosives)	Do.
Garrett M. Mortensen	Coal-mine inspector	Do.
Frank A. Retsel	do.	Do.
Clair S. Sigworth	do.	Do.
Arthur A. Sinicrope	do.	Do.
Joseph E. Stanton	do.	Do.
William T. Torrance	do.	Do.
Pauline Bankovich	Clerical	Do.
Betty Bennett	do.	Do.
Ruth A. Ginley	do.	Do.
Martha A. Karweta	do.	Do.
Lillian T. Levandoski	do.	Do.
Bridget H. Lipp	do.	Do.
Josephine M. Serino	do.	Do.
Helen N. Sigworth	do.	Do.
Gerald W. Croyle	Coal-mine inspector	Schuylkill Haven, Pa.
Theodore F. Deak	do.	Do.
John A. Fulmer	do.	Do.
Frank A. Koza	do.	Do.
Harry A. Schrecengost	do.	Do.
Robert C. Todd	do.	Do.
Harrison F. Wilson	do.	Do.
Sylvia M. Crossley	Clerical	Do.

Health and Safety District B

W. Dan Walker, Jr., District Supervisor
Pittsburgh, Pa.

Alexander E. Morrow, Assistant to District Supervisor

Coal area covered - Pittsburgh Office (Allegheny, Armstrong, Beaver, Butler, Clarion, Fayette, Greene, Lawrence, Mercer, Venango, Washington, and Westmoreland Counties).

F. Delbert Baker	Coal-mine inspector	Pittsburgh, Pa.
James A. Bennett	do.	Do.
Clyde L. Brown	Mining engineer (electrical)	Do.
Wymar G. Cooper	Coal-mine inspector (RC)*	Do.
Robert T. Davis	Coal-mine inspector	Do.
Charles H. Dodge	Health and safety engineer	Do.
Junior H. Dumire	Coal-mine inspector	Do.
Fred R. Hilderbrand	Coal-mine electrical inspector	Do.
John W. Holcomb	Coal-mine inspector	Do.
Ralph I. Krek	Coal-mine electrical inspector	Do.
Earl R. Maise	Mining methods research engineer	Do.
William M. Merritts	Health and safety engineer	Do.
Samuel P. Polack	do.	Do.
Milton J. Satterfield	Coal-mine inspector	Do.
R. Ward Stahl	Health and safety engineer	Do.
Glenn J. R. Toothman	do.	Do.
Everett Turner	Coal-mine inspector	Do.
Joseph J. Wallace	Mining methods research engineer	Do.
Joseph B. Yanity	Coal-mine inspector	Do.
David T. Parry	Coal-mine inspector	Butler, Pa.
Edward C. Dydo	do.	Greensburg, Pa.
Stacy L. Stiles	do.	Do.
John Risko	do.	Grove City, Pa.
Albert C. Husted	do.	Kittanning, Pa.
Lawrence S. Johnston	do.	Do.
Arthur C. Jones	do.	Uniontown, Pa.
Griffin L. Lynch	do.	Do.
William L. Lyons	do.	Do.
Frank Heffers	do.	Washington, Pa.
Robert J. Kirk	do.	Do.
Gordon W. Chastain	do.	Waynesburg, Pa.
Michael A. Yuhase	do.	Do.
Frances A. Begg	Clerical	Pittsburgh, Pa.
Angelina B. Carr	do.	Do.
Rosella E. Everett	do.	Do.
Virginia I. Graham	do.	Do.
Agnes M. Hadfield	do.	Do.
Martha E. Hanulik	do.	Do.
Hilda K. Krumm	do.	Do.
Margaret Lang	do.	Do.
Rose Silver	do.	Do.

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*Roof control.

C. J. Dalzell, Subdistrict Supervisor
Johnstown, Pa.

Coal area covered - Pennsylvania (Bedford, Blair, Cambria, Clearfield, Centre, Clinton, Elk, Huntington, Indiana, Jefferson, Lycoming, Somerset, and Tioga Counties).

Stephen A. Andrejko, Jr.	Coal-mine inspector	Johnstown, Pa.
Wilburn C. Cagley	do.	Do.
Joseph D. Coleman	Coal-mine electrical inspector	Do.
W. M. Demkowicz	Coal-mine inspector	Do.
S. A. Magistrella	do.	Do.
Deward W. Moore	do.	Do.
James A. Moore	do.	Do.
Victor D. Null	do.	Do.
Gomer Reese, Jr.	do.	Do.
Don W. Snow	do.	Do.
De Jack Vittitow	Health and safety engineer (RC)	Do.
John A. Noon	Coal-mine inspector	Barnesboro, Pa.
Omar Elkins	do.	Berlin, Pa.
Norman Rumburg	do.	Cherry Tree, Pa.
Patrick J. Beatty	do.	Clearfield, Pa.
Richard H. Reid	do.	Do.
T. J. McDonald	do.	Ebensburg, Pa.
Walter D. Brown	do.	Indiana, Pa.
W. O. Montgomery	do.	Do.
Charles H. Gaskill	do.	Punxsutawney, Pa.
Harry L. Scott	do.	Do.
Lucille L. Foltz	Clerical	Johnstown, Pa.
Joan B. Franke	do.	Do.
Madeline M. Gelet	do.	Do.
Ethel P. Romeo	do.	Do.
Joan M. Rudolph	do.	Do.
Mary Louise Smutko	do.	Do.

T. C. Higgins, Subdistrict Supervisor
St. Clairsville, Ohio

Coal area covered - Ohio and West Virginia (Brooks, Hancock, Marshall, and Ohio Counties).

Richard E. Barr	Coal-mine inspector	St. Clairsville, Ohio.
John Barry	do.	Do.
William J. Buswink	do.	Do.
John T. Callahan	do.	Do.
John S. Eakins	do.	Do.
Richard Lloyd	Health and safety engineer (RC)	Do.
Edward J. Marron	Coal-mine inspector	Do.
William J. Symons	do.	Do.
John W. Zavora	do.	Do.
Frank E. Hughes	do.	Athens, Ohio.
Joseph C. Reardon	do.	Cambridge, Ohio.
Elsa M. Cara	Clerical	St. Clairsville, Ohio.
Mary E. Duffy	do.	Do.
Anna M. Moskus	do.	Do.
B. S. Phillips	do.	Do.

Health and Safety District C

William R. Park, District Supervisor
Mt. Hope, W. Va.

Coal area covered - Mount Hope Office (south of Jackson, Roane, Braxton, Webster, and Randolph Counties)

Thomas Allamon	Coal-mine inspector	Mount Hope, W. Va.
Arthur Charlesworth	do.	Do.
William M. Cordray	Health and safety engineer (RC)	Do.
Joseph S. Ferraro	Coal-mine inspector	Do.
Lloyd G. Fitzgerald	Mining engineer (explosives)	Do.
M. T. Fuller, Sr.	Coal-mine inspector	Do.
Anthony J. Fumich	Health and safety engineer (RC)	Do.
Frank J. Furin	Coal-mine inspector	Do.
F. J. Gallagher	Mining engineer (electrical)	Do.
James F. Haley	Coal-mine inspector	Do.
Harold M. Hock	do.	Do.
Carl A. Kansala	do.	Do.
Fred E. Kemrite	do.	Do.
Luther A. Lewallen	do.	Do.
John Matsko	do.	Do.
Reid B. McKinley	Mining engineer (electrical)	Do.
W. B. Michaels	Coal-mine electrical inspector	Do.
Anthony Puskas	Coal-mine inspector	Do.
Frank J. Stortz	do.	Do.
P. C. Van Natter	do.	Do.
Paul T. Akers	do.	Logan, W. Va.
James G. Bosley	do.	Do.
Robert Calvert	do.	Do.
William T. Cummings	do.	Do.
Thomas W. Gay	do.	Do.
Oscar W. Harris	do.	Do.
John C. Muir	do.	Do.
Lex Trunko	do.	Do.
James T. Whalen	do.	Do.
David L. Brown, Jr.	do.	Montgomery, W. Va.
Raymond C. DeWeese	do.	Do.
Hobart B. Lynch	do.	Do.
James A. Merrick	do.	Do.
Arthur L. Ulshafer	do.	Pineville, W. Va.
William E. Gaylor	do.	Princeton, W. Va.
Michael J. Hovanec	do.	Do.
Edward M. Lewis	Health and safety engineer (RC)	Do.
Denis C. McGinity	Coal-mine inspector	Do.
Elwood Menta	do.	Do.
William T. Trinkley	do.	Do.
Ward R. Vickers	do.	Do.
John Zeleskey	do.	Do.
F. H. Henderson	do.	Summersville, W. Va.
Leo M. Morelli	do.	Do.
George Noe	do.	Welch, W. Va.
Helen E. Adams	Clerical	Mount Hope, W. Va.
Doris J. Bailey	do.	Do.

Gladys C. Davis	Clerical	Mount Hope, W. Va.
Frances Dixon	do.	Do.
Louise V. Marchio	do.	Do.
Margaret L. McCool	do.	Do.
Norma J. McGraw	do.	Do.
Montana M. Perry	do.	Do.
Pasquale Pino	Custodial	Do.
Wanda June Pino	Clerical	Do.
Mildred M. Price	do.	Do.
Maybelle C. Weaver	do.	Do.
Jewell A. Young	do.	Do.

J. S. Malesky, Subdistrict Supervisor
Barbourville, Ky.

Coal area covered - Kentucky east of Frankfort and west of and including Elliott, Morgan, Mahoffin, and Knott Counties and parts of Letcher and Harlan Counties west of Whitesburg and south of Harlan, respectively.

William E. Duke	Coal-mine electrical inspector	Barbourville, Ky.
Jay D. Farris	Coal-mine inspector	Do.
Elias J. Harris	Health and safety engineer (RC)	Do.
Morris J. Hughes	Coal-mine inspector	Do.
Clarence E. Hyde	do.	Do.
Ralph B. Jones	do.	Do.
Raymond Linville	do.	Do.
T. R. Mark	do.	Do.
Clay Pate	do.	Do.
Thomas A. Redin	do.	Do.
Henry E. Basinger	do.	Harlan, Ky.
Brooks Blackwood	do.	Do.
Dennie R. Hager	do.	Do.
Robert B. Perry	do.	Do.
Nestor L. Adams	do.	Hazard, Ky.
Noah B. Close	do.	Do.
George W. Luke	do.	Do.
William L. Meadows	do.	Do.
Wilma E. Allen	Clerical	Barbourville, Ky.
Alta Faye Bonza	do.	Do.
Janie T. Hammons	do.	Do.
Lucille Light	do.	Do.
Ina McDonald	do.	Do.
Carla J. Sutton	do.	Do.

John J. Dougherty, Subdistrict Supervisor
Morgantown, W. Va.

Coal area covered - Maryland and West Virginia (north of Mason, Kanawha, Clay, Nicholas, and Pocahontas Counties and south of Marshall County).

Jay C. Davis	Coal-mine inspector	Morgantown, W. Va.
William C. Eiduke	do.	Do.
Roy C. Estep	do.	Do.
John C. Hartley	Health and safety engineer (RC)	Do.
Harry Jones	Coal-mine inspector	Do.

Charles D. McMasters	Coal-mine electrical inspector	Morgantown, W. Va.
Louis E. O'Connor	Coal-mine inspector	Do.
Joseph F. Orlando	do.	Do.
R. T. Reay	do.	Do.
George M. Reid	do.	Do.
Matthew I. Duncan	do.	Buchannon, W. Va.
William R. Melville	do.	Clarksburg, W. Va.
Joseph Marshalek	do.	Elkins, W. Va.
William D. Baldwin	do.	Fairmont, W. Va.
Joseph J. Dobis	do.	Do.
John E. Jones	do.	Do.
Thomas J. Ward	do.	Frostburg, Md.
Paul M. Shay	do.	Grafton, W. Va.
Warden L. Evans	do.	Kingwood, W. Va.
Eileen M. Bryant	Clerical	Morgantown, W. Va.
Pauline B. Buretz	do.	Do.
Pauline W. Dusch	do.	Do.
Mary K. Elsey	do.	Do.
Teresa M. Jones	do.	Do.

James L. Gilley, Subdistrict Supervisor
Norton, Va.

Coal area covered - Virginia and those parts of eastern Kentucky east of Elliott, Morgan, Magoffin, and Knott Counties and parts of Letcher and Harlan Counties east of Whitesburg and north of Harlan, respectively.

Leslie E. Allen	Coal-mine inspector	Norton, Va.
Houston C. Brumbaugh	do.	Do.
Patrick J. Buchanan	do.	Do.
John H. Clawson	do.	Do.
George W. Colbert	do.	Do.
Francis A. Cress	do.	Do.
John G. Emershaw	do.	Do.
Frank L. Gaddy	Health and safety engineer (RC)	Do.
George L. Mears	Coal-mine inspector	Do.
George W. Parry	Health and safety engineer	Do.
John J. Pendergast, Jr.	Coal-mine inspector	Do.
Peter F. Stevenson	Coal-mine inspector (RC)	Do.
William R. Stewart	do.	Do.
Carl E. Stinnette	Coal-mine electrical inspector	Do.
John F. Wilson	Coal-mine inspector	Do.
George M. Betchey	do.	Big Stone Gap, Va.
Charles C. Cavendish	do.	Do.
Robert L. Cochran	do.	Do.
C. Leslie Bailey	do.	Grundy, Va.
Charles A. Smith	do.	Do.
Harold R. Baker	do.	Pikeville, Ky.
Durell W. Barger	do.	Do.
William R. Burgess	do.	Do.
Clyde W. Casey	do.	Do.
Calvin F. Watson	do.	Do.
Walter M. Allen	do.	Richlands, Va.
Charles B. Aspinwall	do.	Do.
James W. Cromwell	do.	Do.

Harold H. Wiley	Coal-mine-inspector	Richlands, Va.
Clara K. Banks	Clerical	Norton, Va.
Gladys J. Brooks	do.	Do.
Lundia C. Clark	do.	Do.
Betty Lou Davis	do.	Do.
Joan Green	do.	Do.
Billy W. Greene	Custodial	Do.
Frances B. Lamb	Clerical	Do.
Georgia L. Litton	do.	Do.
Irene Moore	do.	Do.
Betty P. Price	do.	Do.
Pat Bevins Robinson	do.	Do.
Martha C. Smith	do.	Do.

Health and Safety District D

Milton C. McCall, District Supervisor
Birmingham, Ala.

Coal area covered - Birmingham Office - Alabama, Georgia, and North Carolina.

William Arthur	Coal-mine inspector	Birmingham, Ala.
Donald Bowker	do.	Do.
Thomas F. Curry	do.	Do.
Arthur Guthrie	do.	Do.
Carl F. Kahre	do.	Do.
Wilbur G. McCrary	do.	Do.
Henning Marstrander	do.	Do.
Haskel Melhorn	do.	Do.
Joe A. Rejonis	do.	Do.
Harry C. Young	Coal-mine inspector (RC)	Do.
Anna M. McFarland	Clerical	Do.
Jeannette S. Pike	do.	Do.
Catherine W. Ray	do.	Do.
Willette B. Tennent	do.	Do.

Eric H. Brown, Subdistrict Supervisor
Jellico, Tenn.

Coal area covered - Tennessee.

Stephen J. Bukovitz	Coal-mine inspector	Jellico, Tenn.
Charles E. Estep	Coal-mine electrical inspector	Do.
Fornie A. Jordan	Coal-mine inspector	Do.
Joseph Neal	do.	Do.
Wilbur E. Stiles	do.	Do.
Fred W. Stout	Health and safety engineer	Do.
Dee Zimmermann	Coal-mine inspector	Do.
Herbert D. Couk	do.	Crossville, Tenn.
Jack Reese	do.	Do.
Ira Amburgey	do.	Jasper, Tenn.
John D. Martin	do.	Do.
Annie Mae Black	Clerical	Jellico, Tenn.
Lois G. Trammel	do.	Do.
Nona S. Vermillion	do.	Do.
Gladys M. Warming	do.	Do.

Health and Safety District E

Eugene E. Quenon, District Supervisor
Vincennes, Ind.

Coal area covered - Illinois, Iowa, Indiana, Kentucky
(west of Frankfort) and Missouri.

Sanford J. Douglas	Coal-mine electrical inspector	Vincennes, Ind.
Clement M. Dovidas	Coal-mine inspector	Do.
Newton M. Henson	do.	Do.
Leon W. Kelly	Coal-mine inspector (RC)	Do.
James A. O'Connor	Health and safety engineer	Do.
James A. McCune	Coal-mine inspector	Do.
James P. Sheridan	do.	Do.
Francis J. Smith	do.	Do.
Richard W. Whittaker	Health and safety engineer	Do.
Alvin T. Scully	Coal-mine inspector	Belleville, Ill.
Loren A. Belt	do.	Benton, Ill.
Andrew J. Kopp	do.	Do.
M. R. Messersmith	do.	Do.
Coy L. South	do.	Do.
Joseph R. Summary	do.	Do.
Roy E. Seiger	do.	Canton, Ill.
Clifton Dupree	do.	Madisonville, Ky.
Ben J. Dona	do.	Do.
Walter W. Kessler	Coal-mine inspector	Staunton, Ill.
George W. Hammons	do.	Do.
Brank Beck	do.	Taylorville, Ill.
Frank Perz	do.	Terre Haute, Ind.
Irene W. Adams	Clerical	Vincennes, Ind.
Clara M. Dreiman	do.	Do.
Anna C. Kaiser	do.	Do.
Lucile H. Martin	do.	Do.
Mary E. Meyer	do.	Do.
Leonard W. Pieper	do.	Do.
Margarett M. Reeves	do.	Do.
Cecelia C. Speth	do.	Do.
Georgia L. Van Lieu	do.	Do.

Health and Safety District G

George M. Kintz, District Supervisor
Dallas, Tex.

Robert D. Bradford, Subdistrict Supervisor
McAlester, Okla.

Coal area covered - Oklahoma, Arkansas, Kansas, and Texas.

W. Marion Baker	Coal-mine electrical inspector	McAlester, Okla.
Michael Deak, Jr.	Coal-mine inspector	Do.
L. S. Kovash	do.	Do.
Mignonette Grantham	Clerical	Do.
Mary Romano	do.	Do.

Health and Safety District H

J. Howard Bird, District Supervisor
Denver, Colo.

Coal area covered - Colorado, Montana, New Mexico (Colfax and Rio Arriba Counties), North Dakota, South Dakota, and Wyoming (Carbon, Converse, Campbell, Johnson, and Sheridan Counties).

J. J. Bastalich, Jr.	Coal-mine inspector	Denver, Colo.
A. Z. Dimitroff	Mining engineer (electrical)	Do.
Joseph Freeman	Coal-mine inspector	Do.
George B. Fritts	do.	Do.
E. A. Morgan	Health and safety engineer	Do.
A. C. Moschetti	Coal-mine inspector	Do.
D. R. Ratkovich	do.	Do.
I. J. Ratliff	do.	Do.
E. L. Christensen	do.	Billings, Mont.
Andrew Hamilton	do.	Do.
Richard E. Evans	do.	Grand Junction, Colo.
Carl T. Hallett	do.	Trinidad, Colo.
Marie Chambers	Clerical	Denver, Colo.
Emmylu Collins	do.	Do.
Dorothy Kennedy	do.	Do.
Kathryn R. Urban	do.	Do.

Raymond L. Ellis, Subdistrict Supervisor
Anchorage, Alaska

Coal area covered - Territory of Alaska.

Mary T. Edgar	Clerical	Anchorage, Alaska

A. D. Look, Subdistrict Supervisor
Phoenix, Ariz.

Coal area covered - Arizona and New Mexico (except Colfax and Rio Arriba Counties).

William Roberts	Coal-mine inspector	Gallup, N. Mex.
Anne Cordon	Clerical	Phoenix, Ariz.

Robert D. Reeder, Subdistrict Supervisor
Salt Lake City, Utah

Coal area covered - Idaho, Utah, and Wyoming
(all counties not covered by Denver Office).

E. B. Confer	Health and safety engineer	Salt Lake City, Utah.
L. D. Knill	do.	Do.
Thomas O'Neal	Coal-mine inspector	Do.
Thomas T. Reay	do.	Price, Utah.
Harry N. Smith	do.	Do.
Ione Ayre	Clerical	Salt Lake City, Utah.
A. D. Speakman	do.	Do.

L. H. McGuire, Subdistrict Supervisor
Seattle, Wash.

Coal area covered - Washington and Oregon.

E. J. Grillos	Health and safety engineer	Seattle, Wash.
R. G. Johnson	Clerical	Do.

WASHINGTON OFFICE STAFF

BUREAU OF MINES

Thomas H. Miller, Acting Director

James Westfield, Assistant Director - Health and Safety

DIVISION OF COAL-MINE INSPECTION

H. F. Weaver, Chief

Malcom L. Davis	Safety representative.
Raymon K. Franklin	Technical assistant.
Charles M. Keenan	Technical assistant.
George M. Smith	Safety representative.
Margaret A. Bobby	Clerical.
Martha E. Patton	Do.
Coletta A. Schuster	Do.
Eugene R. Slatick	Do.
Perna A. Zott	Do.

TABLE 2. - Distribution of Coal Mine Inspectors and Electrical Inspectors, December 31, 1955

Office	Coal-mine inspectors					Total	Coal-mine electrical inspectors		Total
	GS-9	GS-11	GS-12	GS-13	GS-14		GS-9	GS-11	
Wilkes-Barre, Pa.	0	15	10	0	1	26	0	0	0
Pittsburgh, Pa.	0	14	8	1	1	24	0	2	2
Johnstown, Pa.	0	12	7	1	0	20	0	1	1
St. Clairsville, Ohio..	0	8	2	1	0	11	0	0	0
Mount Hope, W. Va.	0	25	13	0	1	39	1	0	1
Morgantown, W. Va.	0	9	8	1	0	18	0	1	1
Norton, Va.	0	20	6	1	0	27	0	1	1
Barbourville, Ky.	1	12	3	1	0	17	0	1	1
Birmingham, Ala.	0	7	3	0	1	11	0	0	0
Jellico, Tenn.	0	7	2	1	0	10	0	1	1
Vincennes, Ind.	0	11	8	0	1	20	0	1	1
McAlester, Okla.	0	2	0	1	0	3	0	1	1
Denver, Colo.	0	6	4	0	1	11	0	0	0
Salt Lake City, Utah ..	0	1	2	1	0	4	0	0	0
Phoenix, Ariz.	0	1	0	0	0	1	0	0	0
Seattle, Wash.	0	0	0	0	0	0	0	0	0
Anchorage, Alaska	0	0	1	0	0	1	0	0	0
General	0	0	0	5	0	5	0	0	0
Total	1	150	77	14	6	[1]248	1	9	10
Vacancies						25			0
Allotted						273			10

[1] Includes:

6 district supervisors (excluding Districts F and G).
9 subdistrict supervisors (excluding Seattle, Wash.; Phoenix, Ariz.; San Francisco, Calif.; and Albany, N. Y.).
2 safety representatives (liaison officers - Washington).
2 technical assistants (Washington).
1 mines safety representative (Holmes Safety Association).

TABLE 3. - Distribution of engineers, December 31, 1955

Office	GS-9	GS-11	GS-12	GS-13	GS-14	GS-15	Total
Wilkes-Barre, Pa.	0	0	1	0	0	0	1
Pittsburgh, Pa.	0	1	4	3	0	0	8
Johnstown, Pa.	0	0	1	0	0	0	1
St. Clairsville, Ohio	0	1	0	0	0	0	1
Mount Hope, W. Va.	0	3	3	0	0	0	6
Morgantown, W. Va.	0	0	1	0	0	0	1
Norton, Va.	0	1	1	0	0	0	2
Barbourville, Ky.	0	1	0	0	0	0	1
Birmingham, Ala.	0	0	0	0	0	0	0
Jellico, Tenn.	0	0	1	0	0	0	1
Vincennes, Ind.	0	0	1	1	0	0	2
McAlester, Okla.	0	0	0	0	0	0	0
Denver, Colo.	0	0	1	1	0	0	2
Salt Lake City, Utah	0	0	2	0	0	0	2
Phoenix, Ariz.	0	0	0	0	0	0	0
Seattle, Wash.	0	1	0	0	0	0	1
Anchorage, Alaska	0	0	0	0	0	0	0
General	0	0	0	2	2	1	5
Total	0	8	16	7	2	1	34
Branch of Electrical-Mechanical Testing							11
Allotted							45

APPENDIX B

TABLE 1. - Details of inspection data - title II mines - 1955

State	Title II mine inspections	Joint State-Federal inspections1/	Violations sec. 209 observed	Mines at which form B notices were issued	Notices issued			Orders issued			Mines at which orders were issued		Mines free of violations of title II	Title II mines inspected
						Form C								
					Form B (original)	Violations abated	Time extended	Form A 203(a)	Form D 203(c)	Form B-1 203(d)	Form A	Form D		
Alabama	97	0	50	14	30	29	3	0	1	0	0	1	29	41
Alaska	4	2	6	2	6	6	2	0	0	0	0	0	1	2
Arizona	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arkansas	17	0	68	4	31	31	9	3	0	0	3	0	3	6
California	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado	55	0	105	16	40	38	0	1	1	0	1	1	6	23
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Illinois	106	0	313	50	84	93	5	7	0	3	5	0	10	49
Indiana	36	0	135	16	67	70	8	3	1	0	2	1	3	12
Iowa	6	0	0	0	0	0	0	0	0	0	0	0	3	3
Kansas	1	0	2	0	0	0	0	0	0	0	0	0	0	1
Kentucky	706	0	1,797	191	275	547	29	7	25	2	6	11	52	272
Maryland	8	0	4	3	3	3	0	0	0	0	0	0	3	3
Michigan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Missouri	13	0	8	3	3	3	0	0	0	0	0	0	5	7
Montana	8	0	2	0	0	0	0	1	0	0	1	0	1	3
New Mexico	3	0	2	0	0	0	0	0	0	0	0	0	1	1
North Carolina	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Dakota	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ohio	123	0	228	25	49	49	11	1	0	2	1	0	1	47
Oklahoma	13	13	19	1	2	2	0	3	0	0	2	0	1	7
Oregon	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pennsylvania (anthracite)	239	0	199	41	83	74	86	7	4	1	4	2	76	105
Pennsylvania (bituminous)	510	0	1,132	108	290	269	76	3	22	0	3	10	45	190
South Dakota	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tennessee	86	0	151	23	57	56	16	0	6	0	0	3	15	35
Texas	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utah	44	0	81	13	27	25	2	5	0	0	3	0	8	16
Virginia	301	0	822	134	351	305	33	12	2	4	7	2	19	118
Washington	20	20	3	2	4	4	0	1	0	0	1	0	5	8
West Virginia	1,077	0	3,562	276	775	765	127	26	7	3	17	4	56	456
Wyoming	11	11	12	0	0	0	0	0	0	0	0	0	5	5
Totals	3,484	46	8,701	922	2,177	2,369	407	80	69	2/15	56	35	348	1,410

1/ Included in title II mine inspections.
2/ Two orders annulled by the Director or the Federal Coal-Mine Safety Board of Review.

TABLE 2. - Withdrawal orders issued under sec. 203(a) for imminent danger, by States, July 16, 1952 - December 31, 1955

Conditions constituting imminent dangers	Alaska	Arkansas	Colorado	Illinois	Indiana	Kansas	Kentucky	Montana	Ohio	Oklahoma	Pa. (Anth.)	Pa. (Bit.)	Tennessee	Utah	Virginia	Washington	W. Virginia	Total
Man-trip:																		
Dangerous roof	1	-	-	3	-	-	1	1	-	-	-	2	3	-	13	-	14	38
Poor track and equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Man-hoist:																		
Worn rope	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Shaft partition and cages deteriorated	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Mine fire:																		
Active fire adjacent to producing area	1	-	-	1	-	-	2	-	-	-	4	2	-	1	-	-	2	13
Electric-arc hazards and accumulated coal and coal dust	-	1	-	2	-	-	4	-	-	-	-	-	-	-	1	-	2	10
Poor electrical installation	-	-	-	1	-	1	-	-	-	-	-	-	-	-	4	-	4	10
Loose coal, inadequate ventilation, open oil containers	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	3
Black powder, no rock dust, no fire-fighting equipment	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
No fire-fighting equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Mine explosion:																		
Excessive methane liberations	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	3
Methane and dust accumulations	-	-	-	4	1	-	-	-	-	1	-	-	-	-	-	-	1	7
Methane accumulations	-	-	-	1	2	1	-	-	1	-	13	1	-	-	-	-	1	20
Leak in surface gasoline line	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Inadequate rock dusting	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	4	5
Coal-dust accumulations, no rock dust, and poor ventilation	-	2	1	7	-	-	1	-	-	1	-	-	-	-	5	-	16	33
Active mine fire	-	-	-	1	1	-	1	-	-	1	1	-	-	2	-	-	-	7
Black powder and inadequate rock dusting	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Explosion disrupted ventilation	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	2
Coal-dust stemming, no tests for gas, doors open	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2
Excessive methane in air current	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Approaching gas filled sealed area	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Inadequate ventilation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1

TABLE 2. - Withdrawal orders issued under sec. 203(a) for imminent danger, by States, July 16, 1952 - December 31, 1955 (Con.)

Conditions constituting imminent dangers	Alaska	Arkansas	Colorado	Illinois	Indiana	Kansas	Kentucky	Montana	Ohio	Oklahoma	Pa. (Anth.)	Pa. (Bit.)	Tennessee	Utah	Virginia	Washington	W. Virginia	Total
Inundation:																		
Working under body of water	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
Advancing toward abandoned workings	-	-	-	-	-	-	-	-	-	-	1	-	1	-	3	-	-	5
Inflow of oxygen-deficient air	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	3
Impounded water	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Inflow of surface wash ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Total	2	5	3	23	5	2	14	1	1	4	20	9	6	5	28	1	49	178

TABLE 3. - Withdrawal orders issued under sec. 203(c) for failure to abate violations of sec. 209, by States, July 16, 1952 - December 31, 1955

Sections violated	Alabama	Arkansas	Colorado	Illinois	Indiana	Iowa	Kentucky	Missouri	Ohio	Pa. (Anth.)	Pa. (Bit.)	Tennessee	Utah	Virginia	W. Virginia	Total
209(c)	-	-	-	-	-	-	6	-	-	-	2	-	-	1	7	16
209(d)(1)	3	1	-	1	-	-	19	1	1	5	7	3	-	6	5	52
209(d)(2)	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
209(d)(6)	-	-	-	3	-	-	1	-	-	-	1	-	-	-	3	8
209(d)(8)	-	-	-	-	-	-	14	-	1	-	1	-	-	1	-	17
209(d)(9)	-	-	-	1	1	-	2	-	-	-	-	-	-	-	2	6
209(e)(1)	-	-	-	2	-	-	20	-	-	-	9	2	-	12	12	57
209(e)(3)	-	-	-	1	1	4	17	-	1	-	3	2	-	6	5	40
209(e)(4)	-	-	-	-	-	-	6	-	-	-	2	1	-	-	2	11
209(e)(5)	-	-	1	-	1	-	20	-	-	-	12	4	-	13	9	60
209(f)(1)	-	-	-	-	-	-	1	-	-	-	3	-	-	-	2	6
209(g)(1)	-	-	-	1	-	-	3	-	-	-	2	-	-	2	6	14
209(g)(5)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
209(h)(2)	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1	3
209(h)(5)	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	4
Total	3	1	1	12	3	6	109	1	3	7	42	12	1	41	54	296

APPENDIX C

Appeals to the Director on Which Hearings Were Necessary Under Sec. 206 and Appeals to the Federal Coal Mine Safety Board of Review Under Sec. 207, July 16, 1952 - December 31, 1955

	Reason	Disposition by:	
Mine and company	for appeal	Director	Board
	Sec. 203(d) orders		
Maxton Slope mine, Morrisdale Mining Co., Hawk Run, Pa.	Gassy classification	*	Appeal denied 10/18/52.
Glenmar No. 1 mine, Moshannon-Smithing Coal Co., Beccaria, Pa.	do.	Appeal denied 12/31/52.	Appeal denied 2/24/53.
Ponfeigh Pine Hill mine, Ponfeigh Pine Hill, Smokeless Coal Co., Garrett, Pa.	do.	Order annulled 3/2/53. Field investigation 12/8/52.	
Seaboard No. 1 mine, Rebecca Coal Co., Richlands, Va.	do.	Appeal denied 6/16/53.	Appeal made 7/8/53. Annulled 12/3/53.
Carnegie mine, Clean Coal Co., Bellaire, Ohio	do.	Appeal denied (application not made within 20 days).	
Haws No. 7 mine, Haws Refractories Co., Johnstown, Pa.	do.	Appeal denied 8/10/53.	
Princess No. 2 mine, Princess Elkhorn Coal Co., Permele, Ky.	do.	Order annulled 2/11/54.	
Do.	do.	Denied 10/15/54.	Appeal made 11/3/54. Order annulled 1/28/55. Appealed to Court (Board decision affirmed 10/24/55).
Wheelwright mine, Inland Steel Co., Inc. Wheelwirght, Ky.	do.	Appeal made 1/7/55. Denied 3/1/55.	Appealed 3/22/55. Hearing 1/10-17/56. Decision pending.
Banner No. 2 mine, Banner Fuel Corp., Cranes Nest, Va.	do.	Appeal made 1/7/55. Denied 3/28/55.	

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* Blank space means appeal taken directly to Board.

Mine and company	Reason for appeal	Director	Board
Buchanan No. 4 mine, Buchanan County Coal Corp., Big Rock, Va.	Gassy classification	Appeal made 1/12/55. Denied 1/20/55.	
No. 6 mine, Caldonia Coal Co., Norton, Va.	do.	Hearing 3/4/55. Denied 3/11/55.	
No. 2 mine, Harlan-Wallins Coal Corp., Evarts, Harlan County, Ky.	do.	Appealed 3/10/55. Denied 5/11/55.	Appealed 5/13/55. Denied 7/30/55.
Kildee No. 3 mine, Pschirrer & Sons Coal Co., Canton, Ill.	do.	Appealed 3/22/55. Annulled 4/12/55.	
	Sec. 203(c) orders		
Talleydale mine, Snow Hill Coal Corp., Terre Haute, Ind.	1/Violation of Sec. 209(d)(9)	Order annulled 8/4/53	Appeal made for temporary relief 6/5/53. Hearing 6/17/53 extending time for total abatement until 7/11/53.
Williams River No. 1 mine, The Gauley Mountain Coal Co., Cowen, Webster County, W. Va.	do.		Appeal made 1/3/55 based on 209(b). Denied 3/16/55. Affirmed by Court 7/30/55.
Cassity mine, Nos. 2, 3, and 6 openings, Three Fork Coal Co., Inc., Cassity, W. Va.	Violation of 209(e)(1)		Appeal made 12/13/54. Order annulled 3/4/55. Court dismissed appeal.
Crucible mine, Crucible Steel Co. of America, Fuel Division, Crucible, Pa.	Violation of 209(e)(5)		Appeal and relief granted 7/3/55. Hearing 9/12-16/55. Annulled 11/23/55.
	Sec. 203(a) orders		
Kleaner No. 1 mine, Kleaner Coal Co., Bokoshe, Okla.	Explosion danger.		2/Appeal made 9/27/53. Annulled 10/2/53.
Starr No. 2 mine, Starr Coal, Inc., Henryetta, Okla.	do.		2/Annulled 2/14/55.
Do.	do.		2/Annulled 5/12/55.

1/ Failure to make tests for gas before electrical equipment taken beyond the last open crosscut.

2/ State-participation plan in effect. No appeal to Director permitted.

APPENDIX D

TABLE 1. - Number of active coal mines in the Nation - 1955

State	Title I mines		Total title I mines	Title II mines	Total mines
	Strip	Underground			
Alabama	37	291	328	44	372
Alaska	4	2	6	2	8
Arizona	0	2	2	0	2
Arkansas	6	18	24	6	30
California	0	0	0	0	0
Colorado	5	112	117	26	143
Georgia	0	6	6	0	6
Idaho	0	0	0	0	0
Illinois	56	81	137	77	214
Indiana	42	34	76	20	96
Iowa	20	27	47	4	51
Kansas	9	5	14	1	15
Kentucky	75	1,198	1,273	284	1,557
Maryland	16	43	59	3	62
Michigan	0	0	0	0	0
Missouri	10	15	25	8	33
Montana	32	46	78	3	81
New Mexico	5	50	55	1	56
North Carolina	0	0	0	0	0
North Dakota	57	8	65	0	65
Ohio	131	190	321	47	368
Oklahoma	11	15	26	7	33
Oregon	0	4	4	0	4
Pennsylvania (anthracite)	160	673	833	105	938
Pennsylvania (bituminous)	412	705	1,117	190	1,307
South Dakota	5	0	5	0	5
Tennessee	76	615	691	38	729
Texas	0	0	0	0	0
Utah	0	31	31	16	47
Virginia	20	855	875	118	993
Washington	2	8	10	8	18
West Virginia	101	689	790	461	1,251
Wyoming	9	12	21	5	26
Total	1,301	5,735	7,036	1,474	8,510

TABLE 2. - Number of regular inspections, surveys, and miscellaneous investigations and inspections

Period	Field office	Regular inspections			Investigations of injuries and disasters	Surveys					Miscellaneous investigations	Spot-check inspections
		Original	Reinspections	Total		Electrical	Explosives	Ventilation	Float dust	Rock dusting		
1941-54	All	15,418	57,148	72,566	2,662	327	248	34	40	0	1/	1/
1955	Wilkes-Barre, Pa. ...	330	749	1,079	146	0	0	0	0	0	106	55
	Pittsburgh, Pa.	80	433	513	86	6	0	0	0	0	32	2
	Johnstown, Pa.	130	546	676	35	0	0	0	1	0	15	17
	St. Clairsville, Ohio	76	541	617	28	3	1	0	0	0	13	4
	Mount Hope, W. Va. ..	166	860	1,026	195	6	0	0	0	8	23	94
	Morgantown, W. Va. ..	80	583	663	49	0	0	0	0	1	35	22
	Norton, Va.	517	1,090	1,607	79	0	0	0	0	13	16	10
	Barbourville, Ky. ...	285	685	970	44	3	0	0	0	6	9	20
	Birmingham, Ala.	78	633	711	12	0	0	0	0	0	3	2
	Jellico, Tenn.	201	454	655	17	4	0	0	0	0	57	30
	Vincennes, Ind.	21	533	554	72	0	0	1	0	0	41	210
	McAlester, Okla.	11	100	111	3	5	0	0	0	0	35	54
	Denver, Colo.	10	371	381	9	10	0	1	0	2	38	4
	Salt Lake City, Utah.	0	121	121	24	2	0	1	0	0	28	18
	Phoenix, Ariz.	2	88	90	0	0	0	0	0	0	2	3
	Seattle, Wash.	4	35	39	2	0	0	0	0	0	13	1
	Anchorage, Alaska ...	1	9	10	0	0	0	0	0	0	16	0
	Total 1955	1,992	7,831	9,823	801	39	1	3	1	30	482	546
	Grand total	17,410	64,979	82,389	3,463	366	249	37	41	30	2/482	2/546

1/ Not recorded.
2/ 1955 only.

TABLE 3. - Mines inspected, regular inspections, and average inspections per active mine

State	Mines inspected				Inspections made				Average inspections per active mine				Active mines in the Nation			
	A	B	C	Total	A	B	C	Total	A	B	C	Total	A	B	C	Total
Alabama	34	198	41	273	46	558	97	701	1.2	1.9	2.2	1.9	37	291	44	372
Alaska	2	1	2	5	4	2	4	10	1.0	1.0	2.0	1.3	4	2	2	8
Arizona	0	2	0	2	0	5	0	5	-	2.5	-	2.5	0	2	0	2
Arkansas	6	18	6	30	6	27	17	50	1.0	1.5	2.8	1.7	6	18	6	30
California	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Colorado	3	109	23	135	3	199	55	257	.6	1.8	2.1	1.8	5	112	26	143
Georgia	0	6	0	6	0	10	0	10	-	1.7	-	1.7	0	6	0	6
Idaho	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0
Illinois	48	55	49	152	48	80	106	234	.9	1.0	1.4	1.1	56	81	77	214
Indiana	29	20	12	61	29	31	36	96	.7	.9	1.8	1.0	42	34	20	96
Iowa	10	21	3	34	10	30	6	46	.5	1.1	1.5	.9	20	27	4	51
Kansas	9	5	1	15	9	6	1	16	1.0	1.2	1.0	1.1	9	5	1	15
Kentucky	25	918	272	1,215	25	1,035	706	1,766	.3	.9	2.5	1.1	75	1,198	284	1,557
Maryland	10	43	3	56	10	80	8	98	.6	1.9	2.7	1.6	16	43	3	62
Michigan	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Missouri	10	13	7	30	10	13	13	36	1.0	.9	1.6	1.1	10	15	8	33
Montana	13	32	3	48	13	54	8	75	.4	1.2	2.7	.9	32	46	3	81
New Mexico	5	50	1	56	8	95	3	106	1.4	1.9	3.0	1.9	5	50	1	56
North Carolina	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
North Dakota	18	1	0	19	18	1	0	19	.3	.1	-	.3	57	8	0	65
Ohio	128	188	47	363	128	331	123	582	1.0	1.7	2.6	1.6	131	190	47	368
Oklahoma	11	15	7	33	11	21	13	45	1.0	1.4	1.9	1.4	11	15	7	33
Oregon	0	4	0	4	0	5	0	5	-	1.3	-	1.3	0	4	0	4
Pennsylvania (anthracite)	100	633	105	838	101	739	239	1,079	.6	1.1	2.3	1.2	160	673	105	938
Pennsylvania (bituminous)	87	516	190	793	87	592	510	1,189	.2	.8	2.7	.9	412	705	190	1,307
South Dakota	0	0	0	0	0	0	0	0	.0	-	-	.0	5	0	0	5
Tennessee	48	473	35	556	48	521	86	655	.6	.8	2.3	.9	76	615	38	729
Texas	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Utah	0	31	16	47	0	51	44	95	-	1.6	2.8	2.0	0	31	16	47
Virginia	0	566	118	684	0	652	301	953	.0	.8	2.6	1.0	20	855	118	993
Washington	2	8	8	18	2	12	20	34	1.0	1.5	2.5	1.9	2	8	8	18
West Virginia	9	424	456	889	9	540	1,077	1,626	.1	.8	2.3	1.3	101	689	461	1,251
Wyoming	9	12	5	26	10	14	11	35	1.1	1.2	2.2	1.3	9	12	5	26
National data	616	4,362	1,410	1/6,388	634	5,705	3,484	9,823	.5	1.0	2.4	1.2	1,301	5,735	1,474	8,510

A - Strip mines. B - Title I underground mines. C - Title II mines.

1/ Due to intermittent operation or abandonment, it was not possible to inspect some mines that operated part time during 1955.

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TABLE 4. - Average man-days to complete regular inspections and reports

States	Title I mines				Title II mines		All mines	
	Strip		Underground					
	A	B	A	B	A	B	A	B
Alabama	0.9	0.4	0.9	0.4	4.3	0.5	1.3	0.4
Alaska	2.0	.5	1.5	1.0	3.3	1.3	2.4	.9
Arizona	-	-	1.8	.4	-	-	1.8	.4
Arkansas	2.0	.8	2.0	.8	4.5	1.8	2.9	1.1
California	-	-	-	-	-	-	-	-
Colorado	1.7	.7	1.3	.4	3.3	.8	1.7	.5
Georgia	-	-	.9	.4	-	-	.9	.4
Idaho	-	-	-	-	-	-	-	-
Illinois	1.4	.5	1.7	.6	6.1	1.0	3.6	.7
Indiana	1.0	.4	1.5	.6	4.4	1.3	2.4	.8
Iowa	.9	.3	1.1	.5	1.5	.8	1.1	.5
Kansas	1.3	.6	1.8	.5	3.0	2.0	1.6	.6
Kentucky	1.2	.4	.9	.7	2.6	.9	1.6	.7
Maryland	.7	.6	.6	.7	1.0	1.0	.7	.7
Michigan	-	-	-	-	-	-	-	-
Missouri	.9	.5	1.0	.8	1.8	.6	1.3	.6
Montana	.6	.4	1.0	.7	3.1	2.6	1.2	.9
New Mexico	.8	.3	.9	.4	3.3	1.0	1.0	.4
North Carolina	-	-	-	-	-	-	-	-
North Dakota	1.2	.6	1.0	1.0	-	-	1.2	.6
Ohio	1.2	.6	1.1	.8	3.6	.9	1.6	.7
Oklahoma	1.5	.5	1.4	.9	4.2	1.2	2.3	.9
Oregon	-	-	2.6	.6	-	-	2.6	.6
Pennsylvania (anthracite)	.5	.6	1.1	.8	7.0	1.1	2.3	.9
Pennsylvania (bituminous)	.9	.6	.9	1.0	4.8	1.2	2.6	1.1
South Dakota	-	-	-	-	-	-	-	-
Tennessee	.6	.5	.7	.7	2.7	1.0	1.0	.7
Texas	-	-	-	-	-	-	-	-
Utah	-	-	1.3	.4	4.0	.8	2.6	.6
Virginia	-	-	1.0	.8	2.4	1.1	1.5	.9
Washington	1.3	.5	1.3	.6	3.6	.6	2.7	.6
West Virginia	.8	.7	.8	.6	3.7	.8	2.8	.7
Wyoming	1.2	.4	1.0	.5	3.2	.5	1.7	.5
National data	1.0	.5	1.0	.7	3.8	.9	2.0	.8

A - Average days to complete regular inspection. Includes inspection, travel, preparing and posting preliminary report or notices or orders, conference with mine personnel, and preparing notes and sampling cards.

B - Average days for inspector to prepare rough draft of inspection report.

TABLE 5. - Special inspections and average total time to complete an inspection under title II - 1955

Field office	Special inspections	Man-days making special inspections		Regular[1] inspections, title II mines	Average additional man-days per regular inspection	Average[2] man-days per regular inspection	Average total time per title II inspection
		Total	Ave. per special inspection				
Alabama	30	29	1.0	97	0.3	4.3	4.6
Alaska	2	1	.5	4	.3	3.3	3.6
Arizona	-	-	-	-	-	-	-
Arkansas	3	12	4.0	17	.7	4.5	5.2
California	-	-	-	-	-	-	-
Colorado	38	57	1.5	55	1.0	3.3	4.3
Georgia	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-
Illinois	108	110	1.0	106	1.0	6.1	7.1
Indiana	44	44	1.0	36	1.2	4.4	5.6
Iowa	0	0	0	6	0	1.5	1.5
Kansas	0	0	0	1	0	3.0	3.0
Kentucky	460	452	1.0	706	.6	2.6	3.2
Maryland	3	2	.7	8	.3	1.0	1.3
Michigan	-	-	-	-	-	-	-
Missouri	3	3	1.0	13	.2	1.8	2.0
Montana	1	2	2.0	8	.3	3.1	3.4
New Mexico	0	0	0	3	0	3.3	3.3
North Carolina.	-	-	-	-	-	-	-
North Dakota ..	-	-	-	-	-	-	-
Ohio	56	67	1.2	123	.5	3.6	4.1
Oklahoma	2	9	4.5	13	.7	4.2	4.9
Oregon	-	-	-	-	-	-	-
Pennsylvania (anthracite)..	102	72	.7	239	.3	7.0	7.3
Pennsylvania (bituminous)..	276	328	1.2	510	.6	4.8	5.4
South Dakota ..	-	-	-	-	-	-	-
Tennessee	73	57	.8	86	.7	2.7	3.4
Texas	-	-	-	-	-	-	-
Utah	33	97	2.9	44	2.2	4.0	6.2
Virginia	240	218	.9	301	.7	2.4	3.1
Washington	10	19	1.9	20	1.0	3.6	4.6
West Virginia..	876	873	1.0	1,077	.8	3.7	4.5
Wyoming	0	0	0	11	0	3.2	3.2
National data, inspection work	2,360	2,452	1.0	3,484	.7	3.8	4.5
Average time to write inspection report							.9
Total average time, title II mine							5.4

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[1] See appendix B - table 1.

[2] See appendix E - table 4.

APPENDIX E

Violations of the Federal Mine-Safety Codes

State	Title I underground mines				Title II mines			
	Mines[1] inspected	Violations reported[2]	Average violations per mine inspected	Mines free of violations	Mines[1] inspected	Violations reported[2]	Average violations per mine inspected	Mines free of violations
Alabama	198	6,711	34	0	41	251	6	17
Alaska	1	21	21	0	2	33	17	0
Arizona	2	10	5	1	0	-	-	-
Arkansas	18	688	38	0	6	164	27	0
California ...	-	-	-	-	-	-	-	-
Colorado	109	634	6	2	23	149	6	4
Georgia	6	138	23	0	0	-	-	-
Idaho	-	-	-	-	-	-	-	-
Illinois	55	1,094	20	0	49	723	15	1
Indiana	20	542	27	0	12	273	23	0
Iowa	21	659	31	0	3	56	19	0
Kansas	5	210	42	0	1	26	26	0
Kentucky	918	20,352	22	2	272	5,053	19	7
Maryland	43	1,261	29	0	3	40	13	0
Michigan	-	-	-	-	-	-	-	-
Missouri	13	364	28	0	7	175	25	0
Montana	32	384	12	1	3	18	6	1
New Mexico ...	50	360	7	1	1	5	5	1
North Carolina	-	-	-	-	-	-	-	-
North Dakota..	1	23	23	0	0	-	-	-
Ohio	188	4,998	27	0	47	1,053	23	0
Oklahoma	15	417	28	0	7	52	7	2
Oregon	4	25	6	1	0	-	-	-
Pennsylvania (anthracite).	633	6,941	11	4	105	1,009	10	2
Pennsylvania (bituminous).	516	8,377	16	0	190	3,290	17	9
South Dakota..	-	-	-	-	-	-	-	-
Tennessee	473	8,763	19	1	35	708	20	1
Texas	-	-	-	-	-	-	-	-
Utah	31	274	9	2	16	194	12	3
Virginia	566	16,023	28	0	118	2,474	21	4
Washington ...	8	56	7	0	8	66	8	0
West Virginia.	424	9,306	22	0	456	11,271	25	6
Wyoming	12	96	8	3	5	13	3	0
National data	4,362	88,727	20	18	1,410	27,106	19	58

[1] See appendix E, table 3.

[2] Includes all violations found during first inspections made during the year and all new violations found during subsequent inspections.

APPENDIX F

Percent compliance with recommendations on violations of the Federal Mine-Safety Codes, 1954 and 1955

State	1954		1955	
	Title I	Title II	Title I	Title II
Alabama	9	32	9	28
Alaska	9	60	97	33
Arizona	47	-	70	-
Arkansas	14	55	21	72
California	-	-	-	-
Colorado	55	75	49	72
Georgia	11	-	0	-
Idaho	0	-	-	-
Illinois	31	48	31	45
Indiana	31	52	33	57
Iowa	16	22	13	39
Kansas	19	33	19	11
Kentucky	11	38	11	48
Maryland	22	36	21	67
Michigan	-	-	-	-
Missouri	34	60	16	25
Montana	11	83	11	61
New Mexico	40	20	36	60
North Carolina	-	-	-	-
North Dakota	27	-	51	-
Ohio	26	60	28	49
Oklahoma	16	67	15	82
Oregon	14	-	28	-
Pennsylvania (anthracite)	18	51	15	47
Pennsylvania (bituminous)	29	70	22	69
South Dakota	-	-	-	-
Tennessee	8	56	18	72
Texas	-	-	-	-
Utah	47	77	39	74
Virginia	5	47	9	46
Washington	27	35	5	17
West Virginia	21	52	26	60
Wyoming	34	65	21	55
National average	16	52	17	56

APPENDIX G

TABLE 1. - Title I mines at which no violations of the Federal Mine-Safety Codes were observed during an inspection

1955		
State	Mine	Company
Alabama	Jagger[1]	Chickasaw Jagger Coal Co.
Do.	Rocky Hollow[1]	Debardeleben Coal Corp.
Do.	Marigold[1]	Marigold Coal Co., Inc.
Do.	Robbins[1]	Robbins Coal Co., Inc.
Colorado	Hidden Treasure	Jene Hicks, operator.
Do.	Thompson Creek No. 3	Thompson Creek Coal and Coke Corp.
Kansas	No. 19[1]	Pittsburg and Midway Coal Co.
Kentucky	No. 30	U. S. Steel Corp.
Do.	Vogue Coal Co. Strip mine[1]	Terteling Bros., Inc.
Montana	Rosebud[1]	Foley Bros., Inc.
Do.	Peuse[1]	Laura Peuse, lessee, Gordon Peuse, operator.
Do.	Hanson	Perry Hanson et al., licensees and operators.
Do.	Hanic[1]	Anthony Hanic et al., licensees and operators.
Do.	Schonenbach[1]	F. L. Schonenbach et al., licensees and operators.
New Mexico	Window Rock	Navajo Tribe.
Oregon	Vernonia	Vernonia Coal Mine Co.
Pennsylvania (anthracite)..	Marcy[1]	Empire Coal Co.
Do.	Franklin Slope	Franklin Coal Co.
Do.	No. 3 drift	Furtini Coal Co.
Do.	No. 96 Slope	Glen Coal Co.
Do.	Old Forge[1]	Lackawanna Mining & Construction Co.
Do.	No. 1 Drift	Springfield Coal Co.
Pennsylvania (bituminous)..	No. 16 Auger[1]	Mech Mining Co.
Tennessee	Dean No. 2[1]	Dean Coal Co., Inc.
Do.	No. 7	Brushy Mountain Coal mines.
Do.	Pine Ridge[1]	Bruns Coal Co.
Utah	American	American Fuel Co.
Do.	Star Point	Star Point Coal Co.
Wyoming	Nugget[1]	Nugget Coal Co.
Do.	Nuggett No. 2[1]	Nugget Coal Co.
Do.	Rock Springs No. 8	The Union Pacific Coal Co.
Do.	Welch[1]	Welch Coal Co.

[1] Strip mines.

TABLE 2. - Title II mines at which no violations of the Federal Mine-Safety Codes were observed during an inspection

	1955	
State	Mine	Company
Alabama	*Labuco	Alabama By-Products Corp.
Do.	*Maxine	Do.
Do.	*Praco	Do.
Do.	Gorgas No. 4	Alabama Power Co.
Do.	*Gorgas No. 5	Do.
Do.	*Black Diamond No. 1 and No. 2	Black Diamond Coal Mining Co.
Do.	*Blue Creek	Do.
Do.	*No. 8	Davidson Coal Co.
Do.	*Sayre	Republic Steel Corp.
Do.	*Sayreton No. 1	Do.
Do.	*Concord No. 1	Tennessee Coal and Iron Division, U. S. Steel Corp.
Do.	*Docena	Do.
Do.	*Edgewater	Do.
Do.	*Hamilton	Do.
Do.	*Short Creek No. 19	Do.
Do.	*Dolomite No. 3	Woodward Iron Co.
Do.	*Mulga	Do.
Colorado	*Hawk's Nest	Champion Coal Mining Co., The.
Do.	Allen	Colorado Fuel and Iron Corp.
Do.	*Frederick	Do.
Do.	Morley	Do.
Illinois	Carmac	Carmac Coal Co.
Kentucky	Federal No. 2	Caudill Ward Coal Co.
Do.	*No. 214	Consolidation Coal Co.
Do.	*Price No. 1	Inland Steel Co., Inc.
Do.	*Price No. 2	Do.
Do.	Pond Creek	Norfolk & Western Railway (Fuel Dept.).
Do.	*High Splint No. 1	Stonega Coke and Coal Co.
Do.	Glenbrook Colliery No. 2	Webb's Coal & Mining Co.
Montana	*Keene No. 2	Mountain States Mining Co.
New Mexico	*Koehler	Kaiser Steel Corp.
Oklahoma	*Carbon No. 5	Lone Star Steel Co.
Do.	McCurtain	Do.
Pennsylvania (anthracite)	*No. 1 Slope	Newport Excavating Co.
Do.	*No. 2 Slope	Do.
Pennsylvania (bituminous)	Eureka No. 37	Berwind-White Coal Mining Co.
Do.	Eureka No. 40B	Do.
Do.	Harwick	Duquesne Light Co.
Do.	*Indianola	Republic Steel Corp.
Do.	*Bridgeport	U. S. Steel Corp.
Do.	*Karen	Do.
Do.	*Leisenring No. 2	Do.
Do.	Palmer	Do.
Do.	Isabella	Weirton Coal Co.

*Mines appear in tables 2 and 3.

TABLE 2. - Title II mines at which no violations of the Federal Mine-Safety Codes were observed during an inspection (Con.)

1955		
State	Mine	Company
Tennessee	*Lockheart	Howard Higgins Coal Co.
Utah	*Book Cliffs	Book Cliffs Coal Co.
Do.	*Sunnyside No. 1	Kaiser Steel Corp.
Do.	*Sunnyside No. 3	Do.
Virginia	*Moss No. 2	Clinchfield Coal Corp.
Do.	*Crossbrook	Stonega Coke and Coal Co.
Do.	*Osaka	Do.
Do.	*Roda No. 3	Do.
West Virginia	No. 6 Eccles	Eastern Gas and Fuel Associates, Coal Division.
Do.	Alloy No. 2	Electro-Metallurgical Co.
Do.	*Hernshaw	Do.
Do.	No. 2	Olga Coal Co.
Do.	*No. 6 East	U. S. Steel Corp.
Do.	*No. 9	Do.
Do.	*Beech Bottom	Windsor Power House Coal Co.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection

1955		
State	Mine	Company
Alabama	Bradford	Alabama By-Products Corp.
Do.	*Labuca	Do.
Do.	*Maxine	Do.
Do.	*Praco	Do.
Do.	Gorgas No. 3	Alabama Power Co.
Do.	*Gorgas No. 5	Do.
Do.	*Black Diamond No. 1 and 2	Black Diamond Coal Mining Co.
Do.	Blockton No. 9	Do.
Do.	*Blue Creek	Do.
Do.	Blossburg "E"	Brookside-Pratt Mining Co.
Do.	*No. 8	Davidson Coal Co.
Do.	No. 9	Do.
Do.	Empire No. 3	Debardeleben Coal Corp.
Do.	No. 2	G. M. Phillips.
Do.	Moro No. 3	Moro Brothers Coal Co.
Do.	Birmingport	Pratt Coal Co.
Do.	*Sayre	Republic Steel Corp.
Do.	*Sayreton No. 1	Do.
Do.	*Concord No. 1	Tennessee Coal and Iron Division, U. S. Steel Corp.
Do.	*Docena	Do.
Do.	*Edgewater	Do.
Do.	*Hamilton	Do.
Do.	*Short Creek No. 19	Do.
Do.	No. 1	Sexton Coal Co.
Do.	Kellerman No. 19	Twin Seam Mining Co.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

1955		
State	Mine	Company
Alabama	Bessie	U. S. Pipe and Foundry Co.
Do.	Flat Top	Do.
Do.	*Dolomite No. 3	Woodward Iron Co.
Do.	*Mulga	Do.
Alaska	Suntrana	Suntrana Mining Co., Inc.
Arkansas	Clarksville	Clarksville Coal Co.
Do.	Jewel	Jewel Mining Co.
Do.	Quality No. 2	Quality Excelsior Coal Co.
Colorado	*Hawk's Nest	Champion Coal Mining Co., The.
Do.	*Frederick	Colorado Fuel and Iron Corp.
Do.	Harris	Colorado and Utah Coal Co.
Do.	Calumet No. 2	Delcarbon Coal Co.
Do.	Eagle	Imperial Coal Co.
Do.	Pikeview	Pikes Peak Fuel Division, Golden Cycle Corp.
Illinois	Belle Valley	Belle Valley Coal Co.
Do.	New Black Crystal	Black Crystal Coal Co.
Do.	New Wilson	Cutler Coal Co., Inc.
Do.	Deer Creek	Deer Creek Coal Co.
Do.	No. 1	Harrisburg Coal Co.
Do.	Cantine No. 4	Lumaghi Coal Co.
Do.	Murdock	Murdock Division, Bell and Zoller Coal Co.
Do.	No. 16	Sahara Coal Co.
Do.	Schubert No. 1	Schubert Coal Co.
Do.	Virden	Virden Mining Corp.
Indiana	Big Oak	Big Oak Coal Co.
Do.	Pandora	Pandora Coal Co.
Do.	White Ash	White Ash Coal Co.
Iowa	D. C. Mine	D. C. Coal Co.
Do.	New Sterling No. 3	Sunshine Coal Co.
Do.	No. 4	Do.
Kentucky	No. 1	Bailey Branch Coal Co.
Do.	No. 1	Big Run Coal and Clay Co.
Do.	Leatherwood No. 2	Blue Diamond Coal Co.
Do.	No. 2	Boldman Fuel Co.
Do.	No. 3	Bowman Elkhorn Coal Co.
Do.	No. 2	Branham's Creek Coal Co.
Do.	No. 9	Carrs Fork Coal Co., Inc.
Do.	Hellier No. 2	Caudill Ward Coal Co.
Do.	New Cinderella	Cinderella Coal Corp.
Do.	C & C Alma	Cline and Chambers Coal Co.
Do.	No. 204	Consolidation Coal Co.
Do.	*No. 214	Do.
Do.	Cedar Grove No. 8	Emperor Coal Co.
Do.	Freeburn	Do.
Do.	No. 3	Everidge Coal Co.
Do.	No. 1	Feds Creek Coal Co., Inc.
Do.	Hemphill No. 6	Floyd County Coal Co.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

	1955	
State	Mine	Company
Kentucky	No. 1	Georgiabel Coal Co.
Do.	No. 3	Harold Fuel Co.
Do.	No. 5	Hill Gail Coal Co.
Do.	*Price No. 1	Inland Steel Coal Co., Inc.
Do.	*Price No. 2	Do.
Do.	Wheelwright	Do.
Do.	Joyce	Joyce Coal Co.
Do.	No. 9	Knott Coal Co.
Do.	No. 3	Liberty Coal Co.
Do.	No. 1	Looney Coal Co.
Do.	Majestic No. 1	Majestic Collieries.
Do.	Poplar Gap No. 1	Do.
Do.	Queen Mary	Mary Helen Coal Corp.
Do.	No. 3	Middle Point Coal Co.
Do.	Pond Creek	Osborne Mining Co.
Do.	No. 4	Peem Coal Co.
Do.	Alma	Phelps Collieries, Inc.
Do.	Republic	Republic Steel Corp.
Do.	No. 3A	Russell Fork Coal Co.
Do.	No. 4	Do.
Do.	Big Chief	Southeast Coal Co.
Do.	Laviers No. 2	Do.
Do.	No. 16	Stearns Coal and Lumber Co.
Do.	No. 18	Do.
Do.	*High Splint No. 1 Glenbrook Colliery	Stonega Coke and Coal Co.
Do.	No. 1	Susie Ann Coal Co.
Do.	No. 1	Thomas Adkins Coal Co.
Do.	No. 2	Do.
Do.	No. 3	Do.
Do.	No. 32	U. S. Steel Corp.
Do.	No. 1	Wallace Valley Coal Co.
Do.	Atkinson	West Kentucky Coal Co.
Do.	Pleasantview	Do.
Do.	No. 3	West Virginia & Kentucky Coal Co.
Do.	No. 2	Willie Bentley Coal Co.
Maryland	Earl No. 2	Schell Coal Corp.
Do.	No. 10	Consolidated Fuel Co., Inc.
Do.	Susann No. 1	Myers Coal Co., Inc.
Missouri	Macey	Ashford Coal Co.
Do.	Baiotto	Billy Creek Coal Co.
Do.	Blacksmith	Blacksmith Coal Co., Inc.
Do.	Bradley	D. L. Bradley Coal Co.
Do.	Klondike	Mosby Coal Co., Inc.
Montana	*Keene No. 2	Mountain States Mining Co.
Do.	Klein	Republic Coal Co.
Do.	Roundup No. 3	Roundup Mining Co., The.
New Mexico	*Koehler	Kaiser Steel Corp.
Ohio	DeCorte	John DeCorte Coal Co.
Oklahoma	*Carbon No. 5	Lone Star Steel Co.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

1955		
State	Mine	Company
Pennsylvania (anthracite)	Kirmar Slope	Biscontini & Sons Coal Co.
Do.	Monitor Drift	C & K Coal Co.
Do.	Capone Colliery	Sam Capone Coal Co.
Do.	Archbald Shaft	Continental-Archbald Coal Co.
Do.	Continental Slope	Do.
Do.	No. 3 Slope	Dancott Coal Co.
Do.	Nos. 7 and 3 Rock Slopes	J. P. Dando Coal Co.
Do.	No. 60 Slope	Dimario Coal Co.
Do.	Hunter Tunnel	Drift Contracting Co.
Do.	Packer Colliery	Duryea Anthracite Co.
Do.	No. 1	Five-Par Coal Company, The.
Do.	No. 9 Tunnel	Genelow Mining Co.
Do.	No. 30 Drift	Gianforcaro Coal Co.
Do.	Powderly	Gillen Coal Mining.
Do.	Audenreid Colliery	Glen Alden Corp.
Do.	Kidder Slope, Empire Kidder Colliery	Do.
Do.	Huber Colliery	Do.
Do.	South Wilkes-Barre Colliery	Do.
Do.	Sugar Notch Colliery	Do.
Do.	Wanamie Colliery	Do.
Do.	No. 80 Slope	Gravine Coal Co.
Do.	No. 14 Slope	Gubbiotti Coal Co.
Do.	Maysville No. 1 Slope Glen Burn Colliery	Hanna Co., The M. A. (Susquehanna Collieries Division)
Do.	Glen Lyon Colliery	Do.
Do.	Maysville No. 2 Slope Glen Burn Colliery	Do.
Do.	Harry E. Shaft	Harry E. Coal Co.
Do.	Heidelberg Colliery	Heidelberg Coal Co.
Do.	No. 3 mine, Loree Colliery	Hudson Coal Co., The.
Do.	Eddy Creek Colliery	Do.
Do.	Boston mine, Loree Colliery	Do.
Do.	No. 5 mine, Loree Colliery	Do.
Do.	Coal Creek Slope	Indian Head Coal Co.
Do.	Owl Hole mine, Eckley Colliery	Jeddo-Highland Coal Co.
Do.	Stockton Colliery No. 3 Slope	Do.
Do.	River Slope	Knox Coal Co., Inc.
	Schooley Colliery	Do.
Do.	Breaker Slope	L. & S. Coal Co.
Do.	No. 18 Slope	Labonoski Coal Co.
Do.	Red Ash	Larksville Coal Co.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

	1955	
State	Mine	Company
Pennsylvania (anthracite)	Humboldt Colliery	Lattimer Coal Corp.
Do.	Dorrance Colliery	Lehigh Valley Coal Co.
Do.	Henry Shaft, Henry Colliery	Do.
Do.	Enterprise Slope, Henry Colliery	Do.
Do.	Wyoming No. 8 Slope, Henry Colliery	Do.
Do.	Franklin Colliery	Do.
Do.	Packer Colliery	Locust Creek Coal Co.
Do.	No. 17 Slope	Mazzoni Coal Co.
Do.	Nos. 1 & 2 Slopes	Michael Mining Co.
Do.	Molinski Colliery	Molinsky Coal Co.
Do.	Erie Colliery	Motley Coal Co.
Do.	*No. 1 Slope	Newport Excavating Co.
Do.	No. 1A Slope	Do.
Do.	*No. 2 Slope	Do.
Do.	No. 2A Slope	Do.
Do.	No. 3 Slope	Do.
Do.	No. 14 Colliery	No. 14 Coal Co.
Do.	No. 52 Slope	No. 52 Slope Coal Co.
Do.	No. 10 Slope	Northwest Coal Co., Inc.
Do.	No. 7 Slope	P & F Coal Co.
Do.	No. 3 Tunnel	Penag Coal Co.
Do.	No. 14 Drifts	Plains-Hilldale Coal Co.
Do.	East Boston	Pringle Coal Co.
Do.	No. 11 Slope	Ploskonka Coal Co.
Do.	Nos. 14 & 44 Tunnels	Do.
Do.	Renninger Colliery	Renninger Coal Co.
Do.	Archbald Slope No. 184	Rogers Bros.
Do.	Bell Mountain Slope	Do.
Do.	Rushbrook Slope	Rushbrook Coal Co.
Do.	Nos. 2, 7, and Rex Slopes	Sarf Coal Co.
Do.	Schneck Colliery	T. W. Schneck Coal Co.
Do.	Penna. No. 1 Slope	Snyder Coal Co.
Do.	Spearhead	Spearhead Mining Co.
Do.	Underwood Slope	Village Slope Coal Co.
Do.	Spring Brook Colliery	Wat-Rap Coal Co.
Do.	No. 15 Slope	West Exeter Coal Mining Co.
Do.	Hyde Park	West Slope Coal Corp.
Pennsylvania (bituminous)	No. 8	"B" Quality Coal Co.
Do.	No. 32	Bethlehem Mines Corp.
Do.	No. 74	Do.
Do.	Pennsy	Bowie Coal Co.
Do.	Brandy Camp No. 5	Brandy Camp Coal Co.
Do.	Creighton	Creighton Coalworks, Inc.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

	1955	
State	Mine	Company
Pennsylvania (bituminous)	Marquete	Dow-Lin Coal Co.
Do.	Melcroft	Eastern Gas & Fuel Associates (Coal Division).
Do.	Sonman Slope "E"	Do.
Do.	Springer	Eberly Coal & Coke Co.
Do.	Evans No. 3	Evans Coal Co.
Do.	Alice	Glass Run Coal Co.
Do.	Susquehanna No. 1	Gregg and Riddle Coal Co.
Do.	Swank No. 23	Hiram Swank's Sons.
Do.	Coyer No. 3	I. E. & Walter Coyer Coal Co.
Do.	Hoover No. 1	I. H. Hoover and Son.
Do.	Kniseley No. 10	Kniseley Coal Co.
Do.	Wynn	Korona Coal Co.
Do.	Leckrone No. 2	Leckrone Coal & Coke Co.
Do.	Marco	Marco Coal Co., Inc.
Do.	Moffitt	Molnar Bros. Coal Co.
Do.	Poland No. 1	Do.
Do.	No. 1	North Sewickley Coal Co.
Do.	No. 1	Patton Clay Manufacturing Co.
Do.	Mongah	Pittsburgh Coal Co.
Do.	Montour No. 4	Do.
Do.	Decker No. 3	Powell Coal Co.
Do.	*Indianola	Republic Steel Corp.
Do.	Lucerne No. 3A	Rochester and Pittsburgh Coal Co.
Do.	Johnson	Sager Coal Co.
Do.	Montour No. 8	Sal-Ray Coal Co.
Do.	Hunter	Sarver Coal Co.
Do.	Riddle	Do.
Do.	No. 6	Sekora's Coal.
Do.	North Point	St. Marys Sewer Pipe Co.
Do.	*Bridgeport	U. S. Steel Corp.
Do.	Collier	Do.
Do.	*Karen	Do.
Do.	*Leisenring No. 2	Do.
Do.	Leisenring No. 3	Do.
Do.	Maxwell	Do.
Do.	Ronco	Do.
Do.	Johnson	Victoria Coal Co.
Do.	Orchard No. 5	Woolridge Coal Co.
Do.	Orchard No. 6	Do.
Tennessee	No. 62	Brewer and Coffelt Coal Co.
Do.	No. 6	Bryant and Sons Coal Co.
Do.	Meadow Creek	Clinchfield Coal Corp.
Do.	No. 7	Fentress Coal and Coke Co.
Do.	Goforth No. 3	Goforth Coal Co.
Do.	No. 60	Gob Coal Co.
Do.	No. 9 West	Graham Coal Co.
Do.	*Lockheart	Howard Higgins Coal Co.
Do.	No. 1	Kirkwood Fuel Co.
Do.	A.B.C.	Meadow Creek Coal Co.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

	1955	
State	Mine	Company
Tennessee	Bumbee	Pipes Brothers Coal Co.
Do.	Moore	Pocahontas Fuel Co.
Do.	No. 3	Ridge Coal Co.
Do.	Clinchmore	Stony Fork Coal Corp.
Do.	No. 1	Two Penny Coal Co.
Utah	*Book Cliffs	Book Cliffs Coal Co.
Do.	Columbia	Columbia-Geneva Steel Division, U. S. Steel Corp.
Do.	Geneva	Do.
Do.	Clear Creek No. 3	Independent Coal & Coke Co.
Do.	*Sunnyside No. 1	Kaiser Steel Corp.
Do.	*Sunnyside No. 3	Do.
Do.	Browning	Petty, Arthur L. - operator.
Do.	Western	Western Coal Mining Co.
Virginia	No. 2	Cantrell Coal Co.
Do.	No. 3A	Cassell Coal Co.
Do.	Moss No. 1	Clinchfield Coal Corp.
Do.	*Moss No. 2	Do.
Do.	Meade	Do.
Do.	No. 2	Holly Creek Coal Co.
Do.	Laurel No. 3	Laurel Branch Coal Co.
Do.	Libby	Miller & Music Coal Co.
Do.	Seaboard No. 1	Rebecca Coal Co.
Do.	Keen Mountain	Red Jacket Coal Corp.
Do.	*Roda No. 3	Stonega Coke and Coal Co.
Do.	Roda No. 5	Do.
Do.	Imboden 2 and 5	Do.
Do.	*Osaka	Do.
Do.	*Crossbrook	Do.
Do.	Pine Branch No. 1	Do.
Do.	Derby	Do.
Do.	No. 2	Sunrise Coal Co.
Do.	No. 4	Wise Coal & Coke Co.
Washington	Bagley No. 1	B & R Coal Co.
Do.	Big Seam Extension	Northwestern Improvement Co.
Do.	Franklin No. 10	Palmer Coking Coal Co., Inc.
Do.	Franklin No. 12	Do.
Do.	No. 4	Roslyn-Cascade Coal Co.
West Virginia	Acme	Acme Coal Co.
Do.	Pinnacle 6	American Coal Co. of Allegany County.
Do.	No. 3	Ames Mining Co.
Do.	No. 7	Armco Steel Co.
Do.	David No. 1, Nos. 1 and 2 openings	Arthurdale Mining Co.
Do.	Bakers Ridge No. 5	Bakers Ridge Coal Co.
Do.	No. 101	Bethlehem Mines Corp.
Do.	Henshaw	Brown Fuel Co.
Do.	Junior No. 67	Clark Coal Co.

*Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under title II were observed during an inspection (Con.)

	1955	
State	**Mine**	**Company**
West Virginia	No. 2	Compass Coal Co.
Do.	No. 5	Do.
Do.	No. 4	Craigsville Coal Co.
Do.	Donegan 3-F	Donegan Coal and Coke.
Do.	Donegan 3-C	Do.
Do.	*Hernshaw	Electro-Metallurgical Co.
Do.	No. 1	Fields Creek Coal Co.
Do.	No. 3	Fox Coal Co.
Do.	Frances	Frances Mining Co.
Do.	No. 4	Haller Coal Co.
Do.	No. 9	Hanson & Sons
Do.	Quinwood No. 2	Imperial Smokeless Coal Co.
Do.	Quinwood No. 3	Do.
Do.	Jean Ann No. 9	Jean Ann Coal Co.
Do.	Virginia	Johnson Coal Co.
Do.	Arkwright No. 1 - Lynch Air Shaft	Johnson, R. G., Construction Co., contractor for Christopher Coal Co.
Do.	Ream No. 2	Kray Coal Co.
Do.	Ream No. 18	Do.
Do.	Timtony	Left Fork Fuel Co.
Do.	Williams Nos. 1 and 2 Openings	Lick Run Coal Co.
Do.	Lockview No. 2	Lockview Coal Co.
Do.	No. 1	Mason Brothers Coal Co.
Do.	No. 4	Open Fork Coal Co.
Do.	No. 11	Page Coal & Coke Co.
Do.	No. 6	Panther Coal Co.
Do.	Bergoo No. 4 Mine 4B Opening	Pardee and Curtin Lumber Co.
Do.	No. 1	Pine Swamp Mining Co.
Do.	No. 2	Pond Gap Coal Co.
Do.	Winifrede	Red Jacket Coal Corp.
Do.	No. 5	Ridgeview Coal Co.
Do.	No. 1	Royalty Smokeless
Do.	No. 2	Do.
Do.	No. 2-A	Do.
Do.	No. 3	Scott Mining Co.
Do.	No. 3	Scott Coal Mining Co.
Do.	Alden	Shaffer Coal Co.
Do.	No. 1	Smith Coal Co.
Do.	No. 2	Stoney River Coal Co.
Do.	No. 1	Tri-State Mining Corp.
Do.	No. 5 Block	Truax-Traer Coal Co.
Do.	Raccoon 2 west	Do.
Do.	*No. 6 east	U. S. Steel Corp.
Do.	*No. 9	Do.
Do.	No. 1	Wilpen Coal Co.
Do.	*Beech Bottom	Windsor Power House Coal Co.
Do.	No. 2	Yale Mining Co.
Do.	Bull Run No. 4	Zinn Brothers Co., Inc.
Wyoming	Peacock No. 12	Colony Coal Co.
Do.	Rainbow No. 3	Gunn-Quealy Coal Co.
Do.	Brilliant No. 8	Kemmerer Coal Co., The.
Do.	D. O. Clark	Union Pacific Coal Co., The.
Do.	Stansbury	Do.

*Mines appear in tables 2 and 3.

APPENDIX H

Safety-education training of coal-mine personnel - 1955

States	CMAPC for miners	CMAPC for supervisors	Haulage-safety course	Roof-control course	Electrical-safety course	Safety-lamp training	First-aid training	Mine rescue training
Alabama	107	0	2,167	3,984	0	0	0	0
Alaska	15	0	0	0	0	0	88	0
Arizona	0	0	18	28	0	0	50	0
Arkansas	0	0	0	558	0	0	21	0
California	0	0	0	0	0	0	0	0
Colorado	1,021	34	57	3,045	0	0	904	28
Georgia	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0
Illinois	1,673	0	2,619	2,619	0	57	318	25
Indiana	486	0	1,168	1,168	0	63	339	0
Iowa	0	0	146	146	0	0	33	0
Kansas	0	0	0	7	0	0	0	0
Kentucky	2,422	0	7,178	33,067	0	54	1,874	131
Maryland	0	0	0	589	0	1	45	0
Michigan	0	0	0	0	0	0	0	0
Missouri	0	0	58	58	0	0	13	0
Montana	0	0	41	91	0	0	0	0
New Mexico	5	0	325	517	0	0	94	0
North Carolina.	0	0	0	0	0	0	0	0
North Dakota ..	0	0	0	0	0	0	0	0
Ohio	1,208	0	37	9,315	0	0	834	7
Oklahoma	74	30	0	288	0	10	0	12
Oregon	0	0	0	0	0	0	0	0
Pennsylvania (anthracite)..	0	0	0	28,840	0	0	0	0
Pennsylvania (bituminous)..	1/10,539	22	1,323	2,857	0	27	2,055	51
South Dakota...	0	0	0	0	0	0	0	0
Tennessee	362	59	6,868	7,477	0	122	145	8
Texas	0	0	0	0	0	0	0	0
Utah	763	0	1,567	1,557	0	800	0	0
Virginia	280	0	4,161	16,665	0	120	1,169	0
Washington	0	0	59	85	0	0	18	0
West Virginia..	12,871	0	573	59,118	98	71	3,751	178
Wyoming	0	0	11	22	0	0	0	11
Total	1/31,826	145	28,376	172,101	98	1,325	11,751	451

1/ Includes 29 on-the-job trainees.

APPENDIX I

Miscellaneous special assignments

Type of assignments	Wilkes-Barre	Pittsburgh	Johnstown	St. Clairsville	Mount Hope	Morgantown	Norton	Barbourville	Birmingham	Jellico	Vincennes	McAlester	Denver	Salt Lake City	Phoenix	Seattle	Anchorage	Total
Investigating auxiliary blower fans	0	0	0	0	0	0	0	2	0	0	2	0	0	1	0	2	0	7
Investigating mine fires, explosions	0	16	0	7	2	0	0	0	0	0	1	0	1	1	0	1	0	29
Haulage study	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Study of cleaning plants (dust)	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Investigating non-coal-mine accidents	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	3
Safety inspection non-coal mines	0	0	0	0	0	0	0	0	0	0	0	0	3	7	0	0	0	10
Work on outcrop and abandoned-mine fires	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Assisting in recovery of sealed fire area	0	6	1	1	2	0	0	0	0	0	2	0	1	3	0	1	0	17
Participating in legal litigations	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	3
Escorting visitors to mines and plants	0	11	5	0	0	0	0	0	0	0	1	0	6	2	0	1	0	26
Attending safety meetings	0	351	5	0	0	70	0	0	4	7	66	10	11	2	0	0	5	531
Officiating at first-aid and mine rescue contests	0	11	0	0	0	8	0	0	0	3	5	1	0	2	0	0	0	30
Patrolling and testing for CO at culm-bank fire	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Conferences with State and industry representatives	0	4	0	0	0	1	0	0	0	0	2	4	7	3	0	0	0	21
Special explosives studies	0	4	0	2	0	0	0	0	0	0	1	0	1	0	0	0	0	8
Special ventilation study	0	3	0	0	1	0	0	0	0	0	6	7	7	0	0	0	0	24
Preparing safety standards for shaft sinking	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Roof-control study	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
Assisting in mine gassification project	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Investigating abandoned uncharted fuel wells	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Conferences with manufacturers of safety equipment	0	4	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	10
Preparing permissibility schedule on fluorescent lighting	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Preparing schedule on fire-resistant conveyer belts	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Special rock-dusting studies	0	1	0	2	0	0	1	0	2	0	8	0	0	0	0	0	0	14
Special assignments for other Federal agencies	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Study of gas ignitions from friction sparks	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Study of incombustible hydraulic fluids	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Federal Coal-Mine Safety Board of Review hearings	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	3
Dust-allaying studies	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
Preparing electrical safety course	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Assisting State departments	0	0	0	0	0	0	0	0	3	4	3	2	1	0	0	0	0	13
Investigating inrush of surface wash	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Miscellaneous	0	13	2	3	2	0	0	0	2	0	5	2	4	6	0	1	0	40

APPENDIX J

TABLE 1. - Number of injuries and rates per million man-hours exposure (portal to portal)

Period[1]	Fatals	Nonfatals	Man-hours	Rate		Change, percent			
				Fatal	Nonfatal	Fatal	Rate	Nonfatal	Rate
Bituminous									
1932-41	10,036	447,199	6,794,840,163	1.48	65.81	-11	-20	-7	-16
1942-51	8,889	416,646	7,496,573,667	1.18	55.58				
1952-55[2]...	1,532	75,831	1,639,162,904	.93	46.26				
Anthracite									
1932-41	2,295	151,299	1,428,093,979	1.61	105.94	-33	-31	-27	-26
1942-51	1,537	110,234	1,374,622,564	1.11	80.19				
1952-55	285	17,216	255,378,944	1.12	67.41				

[1] Calendar years.

[2] Figures for 1954-55 are preliminary.

TABLE 2. - Number of fatal and nonfatal injuries and injuries per million man-hours exposure, portal-to-portal, in coal mines of the United States

Calendar year	Fatal injuries						Nonfatal injuries					
	Bituminous		Anthracite		Total		Bituminous		Anthracite		Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1932 ...	958	1.77	249	1.59	1,207	1.73	39,352	72.58	16,931	107.88	56,283	80.50
1933 ...	833	1.31	231	1.49	1,064	1.34	43,946	68.87	15,183	98.13	59,129	74.58
1934 ...	958	1.41	268	1.50	1,226	1.43	46,982	69.39	18,577	104.15	65,559	76.63
1935 ...	968	1.46	274	1.78	1,242	1.52	47,529	71.47	15,897	103.16	63,426	77.43
1936 ...	1,098	1.43	244	1.56	1,342	1.45	50,514	65.62	17,026	108.80	67,540	72.91
1937 ...	1,198	1.54	215	1.58	1,413	1.55	52,847	68.05	13,412	98.72	66,259	72.62
1938 ...	880	1.52	225	1.94	1,105	1.59	36,794	63.47	12,842	110.85	49,636	71.36
1939 ...	867	1.36	211	1.71	1,078	1.42	38,544	60.52	13,229	107.37	51,773	68.12
1940 ...	1,204	1.68	184	1.50	1,388	1.65	43,994	61.28	13,782	112.55	57,776	68.75
1941 ...	1,072	1.35	194	1.49	1,266	1.37	46,637	58.93	14,420	110.83	61,057	66.26
1942 ...	1,245	1.41	226	1.64	1,471	1.44	53,193	60.21	13,581	98.73	66,774	65.40
1943 ...	1,225	1.39	226	1.50	1,451	1.40	51,067	57.79	13,527	89.68	64,594	62.44
1944 ...	1,124	1.23	174	1.06	1,298	1.20	51,253	56.02	12,438	76.05	63,691	59.06
1945 ...	925	1.13	143	1.01	1,068	1.11	46,194	56.52	10,923	77.32	57,117	59.58
1946 ...	795	1.09	173	1.14	968	1.10	42,817	58.81	12,533	82.65	55,350	62.93
1947 ...	985	1.23	173	1.18	1,158	1.22	46,025	57.32	11,635	79.41	57,660	60.72
1948 ...	862	1.15	137	.91	999	1.11	42,078	56.28	11,394	75.69	53,472	59.53
1949 ...	494	.93	91	.83	585	.91	27,548	51.67	7,857	71.88	35,405	55.11
1950 ...	550	.92	93	.80	643	.90	28,390	47.73	8,874	76.14	37,264	52.38
1951 ...	684	1.16	101	.95	785	1.13	28,081	47.56	7,472	69.94	35,553	50.99
1952 ...	449	.90	99	1.03	548	.92	23,719	47.64	6,355	66.35	30,074	50.66
1953 ...	397	.89	64	.92	461	.90	20,112	45.26	4,146	59.85	24,258	47.23
1954[1]..	333	1.00	62	1.24	395	1.04	15,460	46.62	3,545	70.96	19,005	49.81
1955[1]..	353	.97	60	1.49	413	1.02	16,540	45.27	3,170	78.54	19,710	48.58

[1] Preliminary data subject to revision.

TABLE 3. - Major coal-mine disasters in the United States and number of persons killed

Calendar year	Number of major disasters	Number of persons killed	Calendar year	Number of major disasters	Number of persons killed
1932 ...	6	145	1944 ...	4	94
1933 ...	1	7	1945 ...	5	68
1934 ...	2	22	1946 ...	2	27
1935 ...	4	35	1947 ...	6	179
1936 ...	5	37	1948 ...	6	49
1937 ...	6	101	1949 ...	0	0
1938 ...	6	84	1950 ...	0	0
1939 ...	1	28	1951 ...	5	157
1940 ...	6	276	1952 ...	[1]2	11
1941 ...	8	73	1953 ...	1	5
1942 ...	7	132	1954 ...	1	16
1943 ...	8	174	1955 ...	0	0

[1] Both before effective date of Federal Coal-Mine Safety Act.

TABLE 4. - Underground fatality experience in the coal industry, title I and title II mines

	1955	1954	1953	1952	1951
Bituminous:					
Title I mines					
Fatalities	57	58	57	60	69
Rate[1]	3.24	3.63	2.70	2.32	2.41
Title II mines					
Fatalities	243	232	292	329	549
Rate[1]	.94	1.00	.95	.87	1.32
Total fatalities	300	290	349	389	618
Rate[1]	1.10	1.17	1.06	.97	1.39
Anthracite:					
Title I mines					
Fatalities	10	14	11	16	8
Rate[1]	26.18	29.60	18.33	17.15	8.05
Title II mines					
Fatalities	39	37	49	69	81
Rate[1]	1.50	1.15	1.20	1.08	1.20
Total fatalities	49	51	60	85	89
Rate[1]	1.85	1.56	1.45	1.32	1.30
All coal:					
Title I mines					
Fatalities	67	72	68	76	77
Rate[1]	3.72	4.37	3.13	2.84	2.61
Title II mines					
Fatalities	282	269	341	398	630
Rate[1]	1.00	1.02	.98	.90	1.31
Total fatalities	349	341	409	474	707
Rate[1]	1.16	1.21	1.11	1.01	1.38

[1] Per million man-hours.

Note: All figures for 1954 and 1955 subject to revision.

APPENDIX K

Number of coal mines in which major improvements were made

Improvements achieved	Ala.	Alaska	Ariz.	Ark.	Calif.	Colo.	Ga.	Idaho	Ill.	Ind.	Iowa	Kans.	Ky.	Md.	Mich.	Mo.	Mont.	N. Mex.
1. Systematic roof-support plan adopted	0	0	0	0	-	0	0	-	2	6	0	0	30	0	-	0	0	0
2. Roof-support plan enforced	17	0	0	0	-	0	0	-	14	13	3	0	156	3	-	16	0	0
3. Use of black blasting powder discontinued	10	0	0	2	-	1	0	-	7	2	1	0	3	1	-	0	2	0
4. New main fan installed	2	1	0	1	-	4	0	-	4	0	0	0	53	4	-	0	1	0
5. Ventilation generally improved	15	2	0	2	-	4	0	-	32	7	5	0	108	4	-	1	0	0
6. Auxiliary blower fans removed	0	0	0	2	-	1	0	-	1	0	1	0	0	4	-	0	0	0
7. Preshift examinations for gas begun	9	0	0	1	-	1	0	-	2	1	2	0	64	10	-	2	0	0
8. Onshift examinations for gas begun	0	0	0	1	-	0	0	-	3	0	0	0	41	7	-	0	0	0
9. Use of water to allay dust begun	0	1	0	0	-	0	0	-	0	0	0	0	3	0	-	0	0	0
10. Rock dust used initially	3	1	0	0	-	1	0	-	0	0	0	0	38	0	-	0	0	0
11. General improvement in rock dusting	6	2	0	2	-	7	0	-	39	8	0	0	105	2	-	0	0	1
12. General improvement in haulage	9	3	0	0	-	2	0	-	11	4	2	0	27	2	-	3	0	0
13. Installation of protective electric devices	24	2	0	3	-	12	0	-	22	12	5	3	73	1	-	4	0	0
14. Second opening provided	5	0	0	0	-	0	0	-	3	0	1	0	3	0	-	0	0	0
15. Smoking underground discontinued	2	0	0	5	-	0	0	-	3	7	1	0	4	0	-	0	0	0
16. Use of open lights discontinued	1	0	0	0	-	0	0	-	6	6	1	0	13	0	-	0	0	0

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Number of coal mines in which major improvements were made (Con.)

Improvements achieved	N. C.	N. Dak.	Ohio	Okla.	Oreg.	Pa. (anth.)	Pa. (bit.)	S. Dak.	Tenn.	Tex.	Utah	Va.	Wash.	W. Va.	Wyo.	Total 1955	Total 1941-55
1. Systematic roof-support plan adopted	-	0	10	1	0	9	15	-	22	-	2	27	0	23	0	147	2,622
2. Roof-support plan enforced	-	0	39	0	0	136	29	-	106	-	2	65	2	132	0	733	(1)
3. Use of black blasting powder discontinued	-	0	7	2	0	0	15	-	52	-	0	7	0	0	0	112	1,736
4. New main fan installed	-	1	10	0	0	7	20	-	104	-	1	32	0	34	0	279	3,198
5. Ventilation generally improved	-	0	66	1	0	118	49	-	104	-	5	56	0	74	0	653	(1)
6. Auxiliary blower fans removed	-	0	2	0	0	1	2	-	5	-	0	3	0	2	2	26	612
7. Preshift examinations for gas begun	-	0	15	1	0	12	29	-	63	-	0	17	0	45	2	276	3,422
8. Onshift examinations for gas begun	-	0	22	1	0	15	24	-	72	-	0	14	0	71	0	271	2,507
9. Use of water to allay dust begun	-	0	0	0	0	2	2	-	0	-	1	2	0	11	0	22	1,050
10. Rock dust used initially	-	0	3	0	0	0	10	-	4	-	0	51	0	17	0	128	1,996
11. General improvement in rock dusting	-	0	44	0	0	0	46	-	6	-	8	33	2	88	0	399	(1)
12. General improvement in haulage	-	0	71	0	0	7	19	-	16	-	0	13	0	227	1	417	(1)
13. Installation of protective electric devices	-	0	179	1	0	62	28	-	24	-	4	32	0	321	4	816	(1)
14. Second opening provided	-	0	5	0	0	9	3	-	14	-	0	4	0	15	0	62	1,025
15. Smoking underground discontinued	-	0	5	2	0	7	13	-	14	-	0	1	0	3	0	67	1,746
16. Use of open lights discontinued	-	0	1	1	0	11	8	-	6	-	0	4	0	4	0	62	1,544

1/ Grand totals not given for these items because further improvements may have been made in some mines previously reported as showing improvements of the same type.

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